

THE MANKIND QUARTERLY



VOLUME XLIV No. 2

Winter 2003

Ecology and Evolution

Subspecies Species
Edited by Professor Roger Pearson

Contents include

- Human Evolution and Speciation, Roger Pearson;
Ecosystem and Genetic System, F.J. Irsigler;
Mammalian Societies and the Emergence of the Family
System, J.W. Jamieson;
Kinship versus Social Materialism, Roger Pearson;
Genetic Altruism, Umberto Melotti; Ethics and the
Social Sciences, Raymond Cattell.

A reliable handbook explaining the evolution of the living races of Man, why the family is the basic unit of all successful human societies, and how human nature only expresses itself smoothly in nations that are ethnically homogeneous.

Paperback.

ISBN 0-941694-00-3. - \$15.00 plus Postage \$3.50 (USA) \$5.50 (foreign)

SCOTT-TOWNSEND PUBLISHERS

Tel (202) 371 2700, or socecon@aol.com with MC / Visa or send
US Cheque or Money Order to
P.O. Box 34070, N.W., Washington, D.C. 20043

THE MANKIND QUARTERLY

EDITORIAL COMMITTEE

PETER BOEV (Sofia, Bulgaria)
BRUNETTO CHIARELLI (Florence, Italy)
RICHARD LYNN (Bristol, England)

EDITORIAL ADVISORY BOARD

J. Gładkowska-Rzeczycka, Gdańsk, Poland; J. Balslev Jorgensen, Copenhagen, Denmark; David de Laubenfels, Syracuse, New York; T.L. Markey, Ann Arbor, Michigan; Umberto Melotti, Milan, Italy; H.F. Mataré, Malibu, California; Edward M. Miller, New Orleans, Louisiana; Clyde E. Noble, Athens, Georgia; Ralph M. Rowlett, Columbia, Missouri; Frederick J. Streng, Dallas, Texas; Charles C. Susanne, Brussels, Belgium; Volkmar Weiss, Leipzig, Germany.

CONTENTS

Symbolization and Conceptualization of Cardinal Directions in Central Eurasia Penglin Wang.....	125
From Grandmother's Shears to the Shield of Achilles: A Look at the European Dimension of the Finnish Folk Culture Eero Jarva	155
Sexual Maturation in Well-Off Chandigarh Boys: A Longitudinal Study A. K. Bhalla.....	175
IQ Population Genetics: It's not as Simple as You Think Gerhard Meisenberg.....	185
Some Further Thoughts on the Subject of IQ Population Genetics J. W. Jamieson	211
Book Reviews: Komi Mythology; A Short History of the World; Black American Students in an Affluent Suburb; Gramsci, Culture and Anthropology; Black Magic: Religion and the African American Conjuring Tradition; In Search of Ancient Ireland: The Origins of the Irish from Neolithic Times to the Coming of the English; The Battle that Stopped Rome: Emperor Augustus, Arminius, and the Slaughter of the Legions in the Teutoburger Forest	233

Cover Picture: Mirror of the Tang period, AD 618-907, showing the
'four supernatural creatures' representing the four quadrants of the
heavens from the *Xi Qing Gu Jian*. (See article: *Symbolization and
Conceptualization of Cardinal Directions in Central Eurasia*).

The Mankind Quarterly is a refereed quarterly journal published by Scott-Townsend
Publishers, P.O. Box 34070, NW Washington DC 20043, U.S.A., telephone (202) 371-
2700; fax (202) 371-1523. Manuscripts for publication may be submitted to that address
in two copies, laid out according to the Chicago Manual of Style. The price of
subscriptions is \$29.50 per annum for students, \$42.50 per annum for other private
individuals, and \$94.00 per annum for libraries and other corporate bodies. Add \$12.00
per year for postage to non-U.S. addresses.

Copyright 2003

ISSN 0025-2344

Symbolization and Conceptualization of Cardinal Directions in Central Eurasia¹

Penglin Wang
Central Washington University

This paper is a comparative analysis of the cognitive correlation between the direction words and the direction symbols, involving Altaic, Sino-Tibetan, and Indo-European in its etymological explanations. In ancient mythology the scaly and shell-covered animals such as turtle, toad, and snake served to be a symbol for the north. This symbolization helped early people in the region to conceptualize the northern direction with the words for these animals. For example, Uigur *paka* 'toad' corresponds to Chinese *pak* 'north', and Chinese *kui* 'turtle' – Mongolian *koina* 'north'. It is only when our understanding of the nature of the direction symbols deepens, that their correlation with the direction words will become known.

Key Words: Cardinal Directions; Central Eurasia; Altaic; Sino-Tibetan; Indo-European; Mythology; Cosmogony; Zoographic symbolism.

1. Introduction

Direction words constitute a set of interdependent references contrasting to each other. In many languages the number of cardinal points differentiated by distinct lexemes runs to four: east and west, south and north. In order to launch a more global treatment of direction words, a broad definition of direction awareness is used as the criterion for inclusion in this study. I regard direction awareness as ranging from the cardinal points to such secondary directions as left and right, front and back, and to upper and lower (or zenith and nadir). A careful examination of the names of these directions and sides will have implications on generalizations about how directions are perceived and determined in human cognition. The number of the direction words tends to be of closed feature, and they belong to the category of basic vocabulary in a language. However, these words have condensed cognitive achievements of human intelligence, and by these words the human beings are able to express and locate directions in their everyday life.

¹ An earlier version of this paper was presented at the 2nd Conference of Graduate Student and Faculty Scholarship, Central Washington University, May 1, 2003.

The cardinal directions may be represented symbolically by celestial bodies and their manifested patterns, animals, and natural phenomena such as winds blowing from certain directions. What has been done so far in the area of symbolization of cardinal points in different cultures did not develop the idea toward a theory of synthesizing the direction symbols and direction words from the cognitive and linguistic perspectives. This paper is a comparative and relativistic analysis of the cognitive correlation between the direction words and the direction symbols in Central Eurasia, involving Altaic, Sino-Tibetan, and Indo-European languages in its etymological explanations. The paper is organized in the following manners. In section 2 I discuss the direction symbolism and its cognitive significance in etymologizing direction words. Section 3 is concerned with the problem in direction words studies by drawing on Altaic data. In section 4 I put forward my etymological solutions to a number of direction words in terms of their cognitive correlation with direction symbols. And section 5 is a conclusion.

2. Direction Symbolism and its Cognitive Significance

In order to carry out a systematic examination of the cross-linguistic interaction of direction symbols and direction words, we need to elaborate in some detail how cardinal points could be symbolically delineated. In history the determination of cardinal points was replete with instances of correlation between direction symbols and direction words. Thus, there were numerous precedents in different cultures for the methods employed and the patterns achieved. The location and possible movement of the celestial bodies in the sky serve to be constant sources and reminders for the human beings to coindex them with directions. This stellar symbolization of directions and time flows probably had been present in the world since unmemorable remote antiquity and should be regarded as the most important pattern the human beings had habituated. In his study of the Roman customs in measuring time flow, Mommsen (1908:267) writes:

In the division of time the returns of sunrise and sunset, and of the new and full moon, most directly arrest the attention of man. Down to a late age sunrise and sunset were proclaimed in the Roman market-place by the public crier, and in like

The Mankind Quarterly

manner it may be presumed that in earlier times, at each of the four phases of the moon, the number of days that would elapse from that phase until the next was proclaimed by the priests.

The widely recognized linguistic use of direction symbolism in the formation of direction words is found in the Indo-European languages. The comprehensive cross-linguistic perspective was provided by Buck (1988:870) in his discussions of the majority of words for the main points of the compass. Buck summarized the classic and resourceful symbolism as involving the use of the position of the sun at a given time of day (rising and setting), characteristic winds, a northern constellation (for some of the words for 'north'), and on one's orientation, which among the Indo-European-speaking peoples was usually facing the sunrise. For instance, according to Buck, words for 'east' are connected with words for 'dawn' or 'morning', with verbs for 'rise', or with words for 'before' or 'in front', all referring to the direction of the rising sun, whereas words for 'west' are derived from those for the 'setting, going down (of the sun)', or 'evening' or 'behind' (871-872). Owing to this cognitive source, Indo-European languages display a considerable variety of the words for 'east' and 'west' as shown in Table 1 (the tables are arranged at the end of the article).

On the whole, the trend toward conceptualization of the eastern and western directions in Indo-European is promoted by the language-internal sources. For this reason, the individual languages differ greatly in their direction lexicalization due to the emphasis placed on the sunrise and sunset, showing about as much diversity in linguistic forms as would their counterparts in any language families. This case offers a number of points that can usefully be considered in the context of more general cross-linguistic studies of the cognitive process underlying the formation of direction words. From this follows that the direction symbols were not simply as a demarcating device for cardinal points, but also, and more significantly in our research, as a blueprint for naming them.

Among the earliest attempts of direction symbolization we find, particularly endeavors to use certain concrete referents, are those in China. The problem involved in the determination has been approached from celestial and zoographic perspectives. The direction symbolism in the form of animals

sprang up in ancient Chinese astronomy as a result of the attempt to divide the celestial sphere into four quadrants about three thousand years ago. This zoographic symbolization should be viewed as the second important pattern the human beings used. The early Chinese identified twenty eight constellations and arranged seven of them to each of the four quadrants of the vault of heaven. In this way, the eastern quadrant was called the 'Green Dragon', the western quadrant – the 'White Tiger', the southern quadrant – the 'Scarlet Bird', and the northern quadrant – the 'Black Warrior', as is well depicted in a mirror during the Tang period of China (see the figure at end of article). It is believed that these four sets of animals were congruent with imaginary configurations of the four celestial spheres of constellations in the dusk during the spring about two millennia B.C.E. In this Chinese symbolism, the four quarters are involved in well-constructed interaction with constellations and animals described with certain colors. The primary manifestation of the Chinese notion of the 'black warrior' was the black tortoise, but it was also amalgamated as a symbol for the north with a larger category of shell-covered and scaly animals such as the snake and the toad as well as with gods of water.

In early Chinese thought the determination of cardinal directions also interacted with other factors such as sides and seasons. Along with what we have discussed above, we can understand the correlation between the factors involved as shown in Table 2.

This line of zoographic symbolism could emerge independently among the people in the different continents. For the Dogon people in a mountain area in West Africa, a world-system is symbolically with four stairways each facing towards one of the cardinal points. Each Stairway held one kind of creature, and was associated with a constellation. In the Dogon symbolism, the north stairway, associated with the Pleiades, was for men and fishes, the south stairway, with Orion's Belt, was for domestic animals, the east stairway, with Venus, was for birds, and the west stairway, with the so-called 'Long-tailed Star', was for wild animals, vegetables, and insects (Griaule 1970:32).

In their civilization the Aztec people in Mexico had a sacred almanac, a 260-day cycle called the *tonalpohualli*, or 'count of

The Mankind Quarterly

days'. Twenty day-signs ran consecutively from Alligator through Flower, repeating after the twentieth day. In the case of cardinal points, each of the twenty day-signs are distributed among the four directions of the universe. One of the four directions with its colors, sacred tree, and sacred bird influenced every day in the life of a person (Carrasco 1998:60). The Mexicans thought of the world as a kind of Maltese cross, the east uppermost, the north on the right, the west below, and the south on the left (Soustelle 1964:123).

In addition to demarcating locations, directions have important symbolic meanings. Many cultures markedly honor the eastern and then southern directions than the northern and western directions. In early China, the eastern direction bears a strong cultural, ritualistic, and political symbolism. The rulers of the Zhou period of China and the Turks in northwestern China shared the same pattern in worshipping the sun. According to the contemporary records, they greeted the sun in the morning when the sun rose. The sun worship developed to the point that the sun itself was alternatively called 'the eastern emperor' in ancient Chinese, so is Manchu word *dergi* meaning 'east, emperor, top'. In modern China, China central TV (CCTV) and broadcasting system begin their operation with the song which had been the most popular in China for a period of time. The song is entitled 'The East is Red', the lyric of which begins with the following sentence: 'The east becomes red, the sun rises, and out of China comes Mao Zedong'. Apparently, through the eternal celestial phenomenon the Chinese people come to associate the rising sun with their leader Mao Zedong. Another well-know political idiom is that, as Chairman Mao declared, the east wind beats the west wind. Here the ideologically-charged directions symbolize the political rituals tied up with the ideas of revolutionary and reactionary forces. For the Aztecs, the day or the year was imbued with the qualities ascribed to each quarter: fertility and abundance to the east, barren aridity to the north, falling-off, old age, and death to the west (setting sun), and a neutral character to the south (Soustelle 1964:123).

3. The Problem in Direction Words Studies

For the Altaic words for cardinal directions in general it has not been possible to carry out an overall comparative analysis that leads to systematic understanding of the cognitive process

involved in the determination of cardinal points and to establishment of etymological connections across many languages in Central Eurasia mainly because of the lack of similarity in linguistic forms, particularly the alignment of direction words as unrelated sets. Accordingly, in Altaic we do not have a cognation of direction words if we base our examination on a specific direction with its signifiers. For example, the north is represented by the different words as in Uigur *šimal*, in Mongolian *koin-a*, and in Manchu *amargi*. At the level of individual constituent groups, the situation may not be as encouraging as we can expect it to be. To state the degree of difficulty with which we proceed to our linguistic analysis, let us start with the Tungusic situation with direction words in selective languages in Table 3.

Listed in Table 3 are closely related languages in the Tungusic group. Due to the historical reasons, the name for the same language has two different labels as Jurchen and Manchu depending on its historical divisions. We should simply consider Jurchen as Middle Manchu. There are two versions of Sino-Jurchen glossary transcribed in Chinese characters during China's Ming dynasty (1386-1644)². The direction words recorded in these two versions are believed to represent two dialects, being of great value for our comparative research, because they provide us with some diverse lexemes for directions. In my comparative framework, the more diverse the words are, the better it would be for our cognitive analysis and etymological explanation. In other words, the diversity in direction glossary presents us both opportunity and challenge. We can identify the major characteristic features in the Tungusic direction glossary in Table 3 as follows:

First, the general tendency in Tungusic is that the south converges with the front in direction conceptualization as the root morpheme *jule-* denotes both the south and the front, so does the north with the back, both of them are represented by the root morpheme *ama-*. Significantly, the front and the back share considerably more cognation running through all the languages in the list than their counterparts – the south and the north. The south is denoted with two different morphemes: the

² These two versions of Sino-Jurchen glossary can be found in Jia and Zhu (1990).

Jurchen *fanti* and the Manchu root *ǰule-*. In all, a total of Jurchen and Manchu words have at some time been glossed as 'north' go to three: the Jurchen *fusge* and *ulti*, and the Manchu *amargi*. Furthermore, the Jurchen words *fanti* 'south' and *ulti* 'north' stand alone in the glossary, having received no systematic explanation of their origin and connection.

Second, the cognation of the words for the east and the west is very poorly presented. The Jurchen (I) conception of the east and the west is affected by the sunrise and the sunset respectively. In Jurchen the word *šeuwen* means 'sun' with *tutilege* 'rising' and *tuhelege* 'setting'. Strictly speaking, these Jurchen expressions are not word units, rather they are the phrases formed by combining the word for 'sun' through describing its rising and setting. This symbolism can be found in some other Altaic languages. In Dagur, people often refer the east to *nar-garǵui* 'sun-rising' and the west to *nar-waŋǵui* 'sun-setting' though the specialized terms are *ǰun* 'east' and *barən* 'west'. Analogous to Dagur, the Salar phrases *gun čixcan yanə* 'east' and *gun patcan yanə* 'west' are also associated with 'the sun-rising direction' and 'the sun-setting direction' with *gun* meaning 'sun', *čixcan* 'rising' and *patcan* 'setting', and *yanə* 'side'.

Third, there is a semantic switch between different languages in relation to certain directions. For example, Manchu and Sibe interchanged the words for 'east' and 'west': Manchu *dergi* 'east' and Sibe *dirhi* 'west', Manchu *wargi* 'west' and Sibe *vārhi* 'east'. The Jurchen (II) word *ǰulesi* 'east' with its root *ǰule-* must be shifted from the meaning of 'south' as indicated in Jurchen (I) *ǰulege* 'south' and in the other Tungusic languages. Also, Sibe *sölxu* 'left' and Hezhe *solki* 'west' have the same origin. The secondary directions such as left and right would turn out to be instrumental for us to look into their possible relation to the cardinal points.

To sum up, the inference of the words for directions and sides in these Tungusic languages rests to a degree on symbolism, similarity or diversity in morphemics, and on reciprocal cross-paradigmatic semantic shifts. It is only when our understanding of the nature of the direction symbols deepened, that their correlation with direction words will become known. Indeed, we would acquire a better sense of the cognitive value of the concrete direction symbols, which are, in most cases we will

be discussing, certain constellations and animals as well as channels through which these symbols could be eventually established as direction words. What I am aiming to do in the remaining discussions is to explore how those symbols serve to be the cognitive motivators in giving rise to linguistic presentation of cardinal points.

4. Methodology and Analysis

In the determination of the east-west axis a commonsense knowledge of the sunrise and sunset had been already taken for granted in everyday life. Due to the constant revolution of the sun during daytime, not all languages have a general word for the sun. In the Australian Aboriginal language Nyawaygi, there is one word for 'sun low in the sky in the morning and in the evening', and another for 'hot sun, when overhead' (Wierzbicka 1992:8). This shows that there is cognitive basis for people to treat the rising sun and setting sun by the same expression to distinguish it from the hot sun when it is overhead. In contrast, the solar reference to the south-north axis becomes less definite. This has some cognitive bearing on the linguistic formation of words for 'south' and 'north'. The Salar language of Turkic group presents some ambiguous situation. In Salar, *yelien* means 'shadow', *yelienkut* (or *yelienkut jamba*) – 'shady side, south', *yelinkut yana* 'south', *guniŝ* denotes 'shady side, north', *guniŝ yana* – 'north' (the data taken from Lin 1992:81, 94; Lin 1985:118). As we can see, in Salar, both *yelienkut* and *guniŝ* may imply 'shady side', but the shady side coexists with the south in one expression. In Indo-European, according to Buck (1988:873), "words for 'south' are often the same as those for 'midday, noon'; other sources are '(rainy) south wind', 'sunny region' (?), and 'right', or with a different orientation 'in front'." Under these circumstances the solar reference is largely replaced by a symbolic sphere concern focusing on a southern and northern constellation in locating of the south-north axis. In Chinese, the constellations in the form of a 'dipper', or *ladel*, had come to be associated with the words for 'north' and 'south' very early by forming the formulaic notions of 'the Northern Dipper' and 'the Southern Dipper' because those dippers were a perpetual guide to the north-south axis. In Chinese, more conspicuous became a northern constellation in the case of the north.

Given the disparity and difficulty in direction glossary in the

closely related languages, we need to work out some feasible methods. First, direction words can be examined against and correlated with their symbolic sources in terms of criteria such as the phonetic resemblance in linguistic forms. As the direction symbols had been well-established for a long time (for the period of thousands years), the symbols must have been widespread in all directions, especially among the adjacent geographic regions. The big challenge with the determination of cardinal points was for early people to procure linguistic sources. While establishing of the concrete symbols for cardinal points was of course a necessary and positive step to form abstract linguistic notions for directions. Therefore, if the direction words in one language are recalcitrant to internal etymological interpretation, we should not hesitate to turn to the symbols in our making a suitable choice from the range of possible referents in the other languages.

Second, direction words should be filtered out in terms of their cognitive significance, cultural implications, and historical context. For instance, the eastern direction may be perceived with prestigious and positive cultural connotation due to its being the sun-rising direction and be compatible with the left side in some cultures. At a given point of time, the cognition of cardinal points involves the distinctive linguistic presentation by which speakers of a language identify or expect to identify different directions. However, in the long run, for internal and external reasons, there may be phonetically recognizable forms, which, nevertheless, differ in their references to directions across languages in the region.

Third, more specifically, there may exist something innovative, in the course of multilayered vocabulary circulation and absorption within a given language and across languages in the region, of a semantic coindexation between a constellation, star(s) standing in the constellation, light in a general sense, and a numeral which counts a constellation and which could be seven in the case of the northern dipper. The availability of this co-reference in everyday communication would not be a problem as it was natural and reasonable for people to comprehend. Now there comes our question. That is, if a given direction happens to be associated with a constellation, could this association eventually be represented either with the name of star, light emitted by stars, or with the number which stands

for the constellation? The direction nomenclature for such generalized or narrowed association is apparent in some languages. As we know, the latter part of the question is recognized in the Latin word *septentriō* 'north' to be a positive answer and to be a source of inspiration for our investigation. As the words for 'north' and 'south' present a large portion of what I will be discussing, this line of thinking will be operationally useful in my analysis.

Since the semantic parallels between the words for 'star', 'light', and for a numeral, to the best of my knowledge, have not yet caught adequate attention of anthropologists and linguists to full extent in direction studies, I shall dwell on methodology of dealing with this issue in some detail. When we come to study this problem, we need to first account for the fact that the effect of celestial bodies may vary from period to period and from place to place. Consequently, the degree in which people perceive the importance of celestial light differs at present and at remote on one hand and differs in the industrialized world and in the rural places on the other. For those who lived under the condition of natural lighting, without man-made equipments for lighting, the role of stars including the sun and the moon was more a matter of everyday need than aesthetic enjoyment. Therefore, the celestial light was conceived by early people in a very different way from the sense in which the modern people understand the term.

The remarkable feature of the north is that it contains no source of light during daytime, since the sun revolves from east to south and then sets in the west. In Chinese cosmogony the pair of concepts *yin* and *yang* constitutes the principle of dualism. In relation to direction, *yang* signifies the sun, light, and south of a hill or north of a river, and *yin* symbolizes the moon, darkness, thus being equivalent to the shade and north of a hill or south of a river. As applied to the secondary directions, the left is *yang*, and the right is *yin*; the front is *yang*, and the back and behind is *yin*. Likewise, in the old Yi writing in southwestern China, the word for the sun and daytime is represented by the same symbol, and the character [] denotes both 'the moon' and 'night' (Ma 1989:653). In the Aztec cosmology, Tezcatlipoca is the dark god of the night sky, the protean god of the night, the god of the Great Bear, the northern god of the night sky, the god of war and magic, and of

The Mankind Quarterly

youth, who was also called Yoalli Eecatl, 'the night wind', Yaotl, 'the warrior' (Soustelle 1964:15, 115, 129). In the Aztec belief system the north is aligned with the night and the Great Bear.

What we know as 'night' is actually the period of time when the sun sets in the western direction and the moon and the stars emerge to shine in the sky. We can say that the night is indeed an interactive reflection of numerous lights emitted by the stars and the moon, which our eyes can perceive. So the night is conceived as the starry or lunar sky in many cultures. When I lived in the countryside in northeastern China, I myself experienced the essential role of the sun, moon, stars in locating time and directions, as at that time electricity and watches were not as popular as they are used at present in the rural region. Moreover, the local belief system was still in the stage of shamanism which persisted even though the revolutionary ideology inspired by the Communist Party had begun to prevail. My father was an amateur stargazer who believed in astrology. If someone has made a big career, he/she must have been blessed with a star in the sky.

In the modern world, the human beings' heavy dependence on celestial lights is obscured by the quite developed man-made lighting systems. Only in times of shortage of power supplies do people become aware of the extent of their reliance on celestial illumination and of their deep debt to it. Indeed, the various status of celestial lighting always stands out as primary in forming our linguistic conception of time divisions such as day, night, morning, noon, and evening. In June 1997, when I took a team of anthropology students to northern China for fieldwork study, students enjoyed observing stars in the sky. In returning home, a student wrote a paper and expressed her experience in observing and admiring the aesthetic beauty of the starry sky at night. She also asked an interesting question 'Why do people not realize this beauty when we are in a metropolitan city?' The answer she has given is that people are so busy. I agree. But in the electronic age the stars are no longer important for the practical purposes: little value in guidance to directions and time.

In the following discussion I assume that the direction symbols and direction words had diffused into many genetically related and areally connected languages by focusing on Central Eurasia – the meeting place for the various peoples of different

linguistic and cultural backgrounds. Our comparative study therefore must go through the relevant languages to enrich our arguments. This area has recorded the relative abundance of terms concerning exchange of direction symbols and direction words. Otherwise, if we confine our analysis to one language only, we will reach nowhere. Once compared on a wide range of languages, direction words and direction symbols will turn out to be interconnected linguistically. As a result, the words for directions in one language appear to be related to the words for symbols in the other language.

4.1. Mongolian Koina 'North' and Chinese Kui 'Tortoise'

The Mongolian *koina* 'north, back, in the rear' consists of the root *koi-* and the suffix *-na*. The root *koi-* is productive in the formation of the following words of related meaning: *koimar* 'hind, behind, (in) the north, northern part', *koisi* 'northward', and *koitu* 'back, rear, north'. The cognates of this word are distributed throughout the Mongolic group: Monguor *huida* 'north, back', *huino* 'behind', *huinoši* 'northward', Baoan *χuita* 'north, back', *huina* 'northward, behind', Dongxiang *kuina* 'north, back', EYu³ *χöitə* 'north, back', and Dagur *huain* 'north, back'. In some of these Mongolic languages the root appears in the form of *hui-* or *kui-*. Given this alternative status of the vowel *u~o* in the root, the Proto-Mongolic root can be reconstructed as **kui~*koi-* 'north' corresponding to Chinese *kui* 'tortoise'. This convergence is plainly due to the symbolic association of the northern direction with the tortoise in the mind of early people in the region. It should be noted that the tortoise is drawn in the ancient petroglyphs in Inner Mongolia Yinshan Mountains (Gai 1986:198) though it is not typical to the region.

4.2. Chinese (Cantonese) Nam 'South' and Mongolian Nam 'Low'

In commonsense perception the south tends to be the direction which is low, while the north being high accordingly. The Chinese formulaic expressions *nančia* 'go down south' and *paišan* 'go up north' are illustrative in the sense that 'down' corresponds to 'south' and 'up' to 'north'. In the Yi region in

³ The following abbreviations of languages names are used in this paper: EYu = the Eastern Yugur language, MMo = Middle Mongolian, WMo = Written (Classical) Mongolian, WYu = the Western Yugur language.

southwestern China, many rivers run from north to south, exerting profound impact on the conceptualization of the northern and southern direction. The Yi people take advantage of this natural setting in coindexing the northern direction with the upper reaches of the river and the southern direction with the lower reaches (Ma 1989:656). In Dagur, when people say *duarida bōbe* '(literally) downward descend', they actually mean 'go southward', and, correspondingly, the phrase *diğda garbe* '(literally) upward ascend'⁴ implies 'to go northward'. In reality, the Mongolia Plateau is characterized with a high and windy landmark. In contrast, the south impressed the Mongols with a low and tranquil landmass. This reality and its resultant perception must have exerted cognitive impact on the linguistic correlation in question.

The Archaic Chinese word **nam* 'south' is developed in Sino-Tibetan and some adjacent languages in at least three semantic tiers with certain phonetic alterations: (a) south, (b) sun, sky, and (c) six. The following are the examples: Hakka *nam*, Mandarin *nan*, Mindong *naŋ*, Xiang *lan*, Gan *lan*, Minnan *lam*, Zhuang *nām~nān*, Buyi *nān*, Maonan *nām*, Mo *nām~nān~nāi* 'south'; Dulong *nam* 'sun', Tibetan *nam* 'sky'; Buyang *nam*, Lade *nam*, Jialai *nam*, Huihui *nān*, Laji *naŋ* 'six'; Gelao *nan* 'six', *nan* 'south'. In order to understand how these three semantic tiers can be connected with one another, we would account for them along the two lines. First, the sunny side is the southern direction as shown in many cultures. Second, since remote antiquity the Chinese people had coined the formulaic notions of the Southern and Northern Dippers and incorporated the cult of worshipping the two constellations in their belief system. As the very names are self-evident, both constellations standing opposite each other at a distance serve as determining points for the southern and northern directions. The Southern Dipper consists of six stars in the shape of a ladle in Sagittarius. This set of six stars triggered the numeracy of six in some adjacent languages. In other words, 'south' and 'six' have intertwined each other in the constellation of the Southern Dipper in the same way as the Latin *septem* 'seven' contributed to the

⁴ As I recall, when a Dagur child heard this formulaic expression he asked if there is any flight of steps to reach the north.

formation of the notions *septentriō* 'the seven stars of the Great or Little Bear' and 'the north'.

Now we return to the Mongolian situation. In my analysis, the root *nam* exists in two tiers. In the first tier, we have the following words and phrases: *nam* 'low; calmness, tranquility, quietness', *nam ġajar* 'a low place, lowland', *namaġu* 'low, slanting', *namda-* 'to calm down, become lower'. Concerning the second tier, we need to go beyond its expressed meaning. The word *namusun*, meaning 'herpes, ulcer, ringworm', consists of the root *nam(u)-* and the suffix *-sun*. Some skin diseases were conceived in a quite different way from what is today in the medicine science. Throughout history certain skin diseases, particularly those contagious, had been viewed as a mystery and filled people with awe. Spots on the skin are scattered and shape like the stars in the sky. If people sustained such an image, they would probably have conceptualized them by virtue of the then existing morphemes for 'star' and the like, which mirrored what people had in their mind. Let us consider the relevant terms in some languages coupled with the ease with which an awesome account of the skin disease may be lexically conveyed. The Chinese name *t'ianhua* for 'smallpox' is literally 'the heavenly flower' due to the starry spots emerging on the skin. In the Kangjia language (Mongolic) the word *čičü* 'flower' is extended to 'smallpox'. For the same disease, the Western Yugur employs the word *puhrqan~purcan~buhrcan* 'Buddha, god', and Mongolian uses the phrase *caġan burkan* 'white god'. As a final example, I shall examine the Tajik word *aftüpüst* 'impetigo'. By using the available dictionary by Gao (1996) in my morphological analysis, I would divide the word *aftüpüst* into *aftü-* and *-püst* and then ascribe the original meaning of the morpheme *aftü-* to 'star' and *-püst* to 'skin'. Thus, the first element of the Tajik *aftüpüst* comes from Tajik *afto* (Sariqul)~*afta* (Woh) 'week (← *star)', and the second is along with Tajik *past* (Sariqul dialect)~*pist* (Woh dialect)~*pust* (Tajikistan) 'skin'. Considering the morphological concatenation with minor phonetic modifications (style of phonetic transcription by different authors, in different occasions, and for different purposes), the original compounding of the two morphemes in Tajik may have been intended to mean 'starry skin'. The nomenclature of skin

diseases in these languages is quite consistent with the people's image of the disease to be implied to an uncontrollable heavenly phenomenon or a starry configuration. The Mongolian *namursun* would parallel this cross-linguistic conception, once denoting starry spots in its early existence.

4.3. Chinese (Cantonese) Pak 'North' and Turkic Paka 'Toad'

The Cantonese *pak* is pronounced in the Minnan dialect as *pak* and in Mandarin as *pai*, all going back to the Old Chinese **pak*. This word is selectively distributed in the minority languages in southern and southwestern China: Zhuang *pak*, Dong *pak*, Mulao *pak*, Maonan *pak*, Mo *pāk~pə*, Lajia *pak*, Jing *bak*, Lai *pə*, Buyi *pe*, Jino *pə*, Gelao *pe*, Shui *pə*, Bai *pu*, Miao (dialect) *pə*, and Qiang *pə~pe* 'north'. Another separate layer of historical circulation of the words for 'north' may have resulted in the meaning of 'seven', e.g. Jing *bai* and Lai *pei* 'seven'. The number seven was named as such in these languages on the pattern of the Northern Dipper consisting of seven stars.

The Altaic languages do not appear to distinguish very clearly between the frog and the tortoise. Clauson (1972:311) remarks that Old Turkic *baka*: by itself means 'frog' and also 'tortoise' if preceded by words meaning 'horn, stone'. In Turkic, for the sense of 'toad, frog' we have Uigur *paka*, Kazakh *paka*, Kirgiz *paka*, Uzbek *bākā*, and WYu *baca*. This Turkic word diffused into some Mongolic languages: WMo *baka*, EYu *baca*, Dongxiang *bağa*, Kangjia *babəHa* (**ba+bəHa*) 'frog, toad', and Kangjia *paka* 'frog'. In Tungusic, Manchu *wakšan* and Sibe *wakshen* 'frog, toad' may be developed from the earlier form **bak+šan*. With the help of the morpheme *taš* 'stone' and its variant forms, the Turkic languages have formed the following words for 'tortoise': Uigur *tašpaka*, Kazakh *tasbaka*, Kirgiz *tašpaka*, Uzbek *tašbākā*, Tatar *tašpaka*, Tuva *dašpaha* 'tortoise'. In Turkic, the Salar language has formed two distinct words in two tiers of lexical circulation: *baca* 'frog', *pağa* 'tortoise'.

In Chinese mythology, as we have mentioned before, the tortoise symbolizes the north in the alternative name of *quanwu* 'the black warrior'. In the Old Uigur documents this notion was translated into *qara yalan* 'the black snake', which was in charge of the northern direction in the sky.

Outside Altaic and Sino-Tibetan, the sphere of influence of this direction symbolism can be also found in Germanic. With

sister groups lacking cognates, Old Norse *bak* and Old English *bæc* 'back, behind' is to be aligned with Turkic *baka* 'toad' and Sino-Tibetan *pak* 'north'. What makes this set of words important is that their referent 'toad' or 'tortoise' stood for the north in ancient mythology, and the north is consistent with the back in human cognition. This etymology suggests to the existence of the early transcontinental connection among Chinese, Altaic, and Germanic in Central Eurasia through the Tokharian language.

4.4. Jurchen *Ulti* 'North', Turkic *Yultuz*~*Yulduz* 'Star', and Tajik *Üvd* 'Seven'

The Jurchen word *ulti* 'north' is once attested in one edition of the Sino-Jurchen Glossary (Grube 1896) compiled during China's Ming dynasty (1368-1644), being since then not found in Manchu and other Tungusic languages. The word occurs together with other words for cardinal points in the Section of Localizers. The word is transcribed with care, and there is no reason to doubt its historical existence in the sense of 'north' in Jurchen. In my previous research (Wang 1995:15) I compared it with Turkic *yultuz* 'star' by erroneously reconstructing the initial **n-* for both Altaic words and connecting it with OE *norð*.

In Old Turkic both *yultuz* and *yulduz* are attested. This word has its reflections throughout the Turkic group with minor phonetic modifications: Uigur *Yultuz*, Kazakh *ǵulduz*, Uzbek *yulduz*, Tatar *yulduz*, and Azerbaijan *ulduz*. Clauson (1972:922) considers this word as a generic term for fixed stars and planets. Tenishev (1997:53) analyzes the suffix *-uz* out of the word *yultuz*. In my view, both the Turkic root **yult-~yuld-* and Jurchen *ulti* correspond to Tajik *üvd* 'seven'. The Tajik *üvd* is taken from Gao (1996). Gao (1985:147) transcribes this Tajik (Sariqul) word as *uvd* along with its Wuh dialectal form *uib*. In connecting the Turkic root **yuld-* and Jurchen *ulti* with the Tajik *üvd*, we must observe the phonetic correspondence between the Turkic lateral *l* and the Tajik *v* both occurring in the postvocalic position. In addition to this major difference, the Turkic **yuld-* has the prosthetic *y* before the vowel *u*.

Semantically, this set of words had evolved to acquire three different meanings most probably by the following scenario. The Jurchen speakers habitually called the Northern Dipper with the number seven, used the dipper in locating the

northern direction, and eventually conceptualized the north with the word for 'seven' at the expenses of losing its numerical signification. Although the Turkic *yultuz* is now used as a generic term for fixed stars and planets, we cannot rule out the possibility whereby the word once connoted the Northern Dipper in its early existence just as the Turkic *yetigen* consisting of the word *yeti* 'seven' and the suffix *-gen* came to denote the Big Dipper.

4.5. Jurchen Fanti 'South' and

Manchu Antu 'The South (Sunny) Side of a Mountain'

This Jurchen word is recorded in Chinese with two characters along with the Jurchen *ulti* 'north'. Tsintsius (1977:43) lumps it together with Orochi *pulala~punala* 'south, southern (wind)', Udehe *pun'alanjini* 'south', and Ulcha *punala* 'southern (wind)'. In this proposed etymology, the meaning fits, but the phonetic shape does not fit well and neither does the final syllable *-ti* of Jurchen *fanti*. For this reason I would connect Jurchen *fanti* with the following set of Tungusic words organized by Tsintsius (1975:44): Evenki *antaya* 'the south side of a mountain, blazing sun', Even *antih* (dialectal form) 'the south side of a mountain', Negidal *antaya* 'the blazing sun', Udehe *anta* 'the south side of a mountain', Nanai *antaĵia* 'sunny side', and Manchu *antu* 'the south (sunny) side of a mountain'. What is remarkable in this set is the presence of the initial fricative *f* in Jurchen *fanti*. Semantically, the sense of 'south' is compatible with that of 'blazing sun' and 'sunny side'.

A further careful examination shows that these Tungusic words may have been derived historically from the early form **alta-*, which in turn from **(h)asta-* meaning 'star' and the like. As I have shown in the previous discussions, the postvocalic liquids *l/r* might be resulted from the lambdacism~rhotacism change which took place in Altaic languages. Furthermore, the Altaic postvocalic liquids may change to a nasal sound, e.g, Mongolian *altan* 'gold' is transcribed as *antan* in Chinese characters and becomes actually pronounced as *antan* in the Dongxiang language. By restoring the Jurchen word *fanti* as **falti* (← **halti* ← **hasti*) we will be able to relate it with Tajik *afta* (Sariqul)~*afto* (Woh)~ *hafta* (Tajikistan) 'week', *haft* (Tajikistan) 'seven', Tokharian *astare~āstre* (B)~ *āštār* (A) 'bright', and Hittite *hašter-* 'star'. The Tokharian chain here is

particularly significant because it is the easternmost Indo-European language reaching the linguistic contact with Altaic.

Parallels to the Tungusic and Indo-European words can be found in Turkic with certain phonetic, morphological, and semantic alterations in several layers of circulation. Let us first consider the following Turkic words: WYu *ahldalʃin* (← **alda* ← **asda*-) 'Ursa Minor (a northern constellation)', *ahldalʃən* 'the three star' (a southern constellation), *ahldən* 'lower', *ahldər* 'lower, under', Tuva *ald(ɣ)* 'under', and Uigur *ald* 'front'. The semantic trait of these words can be understood as motivated by the advantage to make recurring but phonetically and morphologically modified use of the word for 'star'. By favoring both polarities of a northern and southern constellation, the Western Yugur language treats a set of stars as the symbol to be set up for certain directions and then reinterprets them as certain sides. The symbolic signification of a constellation made it inherently versatile in its direction indication and thus subject to reinterpretation in its direction references to both a northern and a southern constellation. At this point, we return to the Evenki *antaya*. Depending on the different dialects, its meaning is either 'the south side of a mountain, blazing sun' or 'the northern side of a mountain, north' (Tsintsius 1975:44). In these cases, a directional denotation is the marked continuation of the unmarked original meaning of 'star', and thus was available for symbolic extension.

In the other layers of distribution in the region, the following sets of words would be considered: Tajik *astor*, Kazakh *astar*, and Tatar *astar* 'the back of a garment'; Uigur *ast(i)* and Kazakh *ast(ə)* 'under'; WYu *art* (← **ast*) 'behind; west; backup force, protector', *artağ~artdāğ* 'western, rear', EYu *ārtə* 'north, back', MMo *antakat* (**anta* (**arta*)+*kat*) 'the western sky'. As we can see, within the adjacent languages we encounter the phonetically similar morphemes for the different directions and sides. When the existence of such a set of semantic correspondences is taken into account in discussing the way in which a given language developed a new meaning, we observe that omni-directional distribution of constellations had affected their codability either of the south (under, lower, front) or the north (back, behind) or the west. Therefore, direction symbols and direction words in cross-linguistic interaction are not

definable as an absolute in their references but were conceived when an expected direction was either available for a name or already filled.

4.6. Manchu *Amargi* 'North' and Chinese Hama 'Toad'

From the synchronic morphological perspective, the Manchu *amargi* 'back, north' contains the root *ama-*. This root is productive in deriving the words and phrases of related meaning such as *amargi usiha oron* 'the Big Dipper', *amasi* 'backward, after', *amasi bumbi* 'to sacrifice to the Big Dipper', *amari* 'after', *amari-* 'to fall behind', *amaga* 'afterwards', and *amala* 'behind, after'. As is listed in Table 3, the Manchu root morpheme is widely distributed in Tungusic group. Moreover, some Tungusic languages have an initial fricative in this morpheme, e.g. Ulcha *hamasí* 'back', Oroki *hamarí* 'back, rear', and Nanai *hamar-amar* 'by, past (to miss)'. On the basis of this overall Tungusic comparison, Tsintsius (1975:36) has reconstructed the Tungusic root **hamar* (**xamap* in Cyrillic transcriptions). Tsintsius (1975:36) also added Mongolian *umara* 'north', *umaraki* and *umaratu* 'northern' to the Tungusic etymology, but with a question mark.

The Chinese *hama* is a cover term for 'frog' and 'toad', being accessible to the Tungusic speakers in northeastern China and the adjacent areas. The early Tungusic speakers seized upon the usage of the toad as a symbol for the north to designate the northern direction and derive some secondary meaning of 'back' and 'after'.

4.7. Jurchen *Fusge* 'North' and Tajik *Fuks* 'Snake'

The Jurchen *fusge* is transcribed with the three characters pronouncing [fuçikə] in Mandarin Chinese. In order to understand the connection between Jurchen *fusge* and Tajik *fuks*, we start with the Tajik dialectal forms. The form *fuks* is from the Woh dialect, and its Sariqul counterpart is *tufushk* (Gao 1985:146). The latter differs phonetically from the former in two ways. First, it has the extra initial syllable *tu-*. Second, it underwent the metathesis: the consonant cluster *ks* in the word *fuks* changed to *sk*. It is the case with the Jurchen *fusge*, which was most likely developed from the early form **fugse* through metathesis.

The Jurchen *fusge* has a very limited distribution in Tungusic. So far I have found the Hezhe word *fərhi* 'north'

comparable with Jurchen *fusge*. The major change involved here is that of rhotacism: the sibilant *s* of the Jurchen *fusge* became rendered as *r* in the Hezhe *fərhi*, accompanied with the minor change of the vowel *u* to *a* and of the velar stop *g* to the velar fricative *h*.

4.8. *Turkic Bars 'Tiger' and Mongolian Baraḡun 'Right, West'*

The Old Turkic *bars* has its reflections in many modern Turkic languages with certain phonetic alterations and morphological compounding: Tuva *par*, Salar *bas*, WYu *bars-barsa*, Uigur *yolwas*, Uzbek *yolbars*, and Tatar *yolbars-yolwars* 'tiger'. Clauson (1972:368) considers the Turkic *bars* (*p*) a very early Iranian loanword and analyzes the Turkic *yolbars* as a compound of *yol* (*yo:l*) meaning here metaphorically 'streak, stripe' and *bars* 'tiger'.

The word *bars* is distributed throughout the Mongolic group: WMo *bars-baras*, Dagur *bar*, EYu *baras*, Monguor *bas*, Dongxiang *bas* 'tiger', and Kangjia *para* 'jackal', *basu* 'tiger'. Under the influence of the ancient Chinese tradition of making the tiger the symbol for the west, the early Mongolic speakers conceptualized the notion of the west with the root morpheme **bar(a)-* for 'tiger' concatenated with the suffix *-ḡun*: WMo *baraḡun* 'right-hand side, right, west, western', Dagur *barən*, EYu *barün*, Dongxiang *borun*, and Monguor *warəṅ* 'west, right'. Semantically, the western direction turns out to be consistent with the right side in the Mongolic conception. The Mongolic word also diffused to some adjacent languages such as Tuva *barün* 'west', Ewenke *barûnda* 'west', and Korean *parun* 'right'.

Whether the Turkic-Mongolic *bars* in its symbolic sense is present in Tungusic is a problem. Morphologically, we can carve out the root *wə-* from Manchu *wargi* 'under, west, right', *wasihün* (**wa+si+hün*) 'downward, westward', and *wala* 'underneath, the west side of a Manchu house'. This analysis is congruous with the morphemic structure of some other direction words in Manchu. For instance, as we have seen in section 4.6, Manchu *amargi* 'back, north', *amasi* 'backward, after', and *amala* 'behind, after' contain the root *ama-*. Phonetically, it is quite possible for the bilabial stop **b* to change to the bilabial fricative *w*, as is shown in our analysis of the connection between Turkic *baka* 'toad' and Manchu *wakšen* 'toad' in section 4.3. Furthermore, this change is also evidenced by Uigur *yolwas* 'tiger', Tatar

The Mankind Quarterly

yolwars 'tiger', and Monguor *waray* 'west'. From these morphological and phonetic perspectives we could relate the Manchu root *wa-* to Turkic-Mongolic *bars*. However, we need to consider the Manchu verb *wasi-* 'to go down, descend, sink', which is allied with Manchu *wasihūn* 'downward, westward'. The problem is that I am not certain if the Manchu verb triggered the notion of 'west' or the Manchu *wasihūn* (**wa+si+hūn*) otherwise derived the verb. For the time being, I would adopt the latter approach.

The tiger is a very powerful symbol across many cultures. Since the remote antiquity the Chinese people believed the tiger as a great power keeping down ghosts and warding off evils. History had witnessed the tiger serving the totem for many ethnic groups. There was an ancient state and ethnic group called *pa* [*pa*] (*ba* in Chinese romanization) in what is now the eastern part of Sichuan Province and Chongqing City in northwestern China. The Ba people existed there starting from about four thousand years ago and mysteriously disappeared about two thousand years ago from the upper and middle reaches of the Yangtze River. It is suggested that the Chinese word *pa* originally meant 'tiger' and served as the totemic symbol for the group and the state, because the people honored the tiger and regarded it their ancestor (Yuan 2003). As a matter of fact, the Altaic word *bars* represents a chain in the historical diffusion of the words for the animals of similar prestige: Hittite *paršana-* 'leopard', Persian *pārs~fārs* 'panther', Tajik *pās* 'leopard', and Old English *bār* 'boar'. The Chinese *pa* was affected in this circulation, too.

4.9. Tajik *šamul~šəmol* 'Wind, North' and Uigur *šamal* 'Wind'

In Tajik, the notions of 'wind' and 'north' are represented by the same word differing in dialectal forms. This shared meaning is due to the fact that wind usually comes from the north in Central Asia⁵.

In Turkic, Uigur *šamal* goes with Kirgiz *šamal*, Uzbek *šāmal*, and Kazakh *samal* 'wind', but this word does not run through the whole group. It is the similar situation with the notion of

⁵ In addition to this word for 'wind', Tajik had acquired the words *buron* 'big wind' and *burušo* 'fierce wind', and MMo *boran* meant 'storm', and Korean *param* is 'wind'. These words are probably related to Latin *boreās* 'north wind, north', Greek *boréa* 'north wind', and English *boreal* 'northern, of the north wind'.

'north'. In the Turkic languages spoken in China we have the following three languages sharing the cognation for 'north': Uigur *šimal*, Uzbek *šimal*, and Tatar *šimal* 'north'. This set of words may have been derived from the Tajik (Woh dialect) *šamol* 'wind, north'.

4.10. Russian Sever 'North'

Buck (1988:872) argues that "Words for 'north' are from the name of a north wind, a northern constellation, 'midnight', 'winter', 'upper region', and from 'left', or under a southern orientation 'behind'." The Church Slavic *sěverŭ*, Russian *sever*, and Lithuanian *šiaurė* 'north' are cited for illustration. To this etymological solution we should add a level further explanation. Though these words derived from the name of a north wind, we may further ascribe the name of a north wind to the Big Dipper represented by seven stars. As Buck (1988: 872) points out, Latin *septentriō* 'north' was originally from the plural form *septentriōnes* 'the seven plow-oxen' (*triō* 'plow-ox'), name of a constellation in the north (the great or little bear). In this case, the Latin number *septen* 'seven' was indeed involved in the formation of the concept of 'north'. In examining the phonetic similarity and semantic relatedness between Old English *seofon*, Old Icelandic *siau*, Swedish *sju* 'seven' and Lithuanian *šiaurė*, Russian *sever* 'north', I would suggest that the two sets of words were once related etymologically probably through a northern constellation. Accordingly, using the number seven to demarcate the north was as symbolic an indicator as the image of a northern constellation in this instance.

In Russian, there were two layers of morphemic diffusion at some point in history. The first was that of phonetically developing the bilabial nasal *m* in the word *sem* 'seven'. The second was that of forming the labiodental fricative *v* in the word *sever* 'north'. This course of diffusion resulted in semantic bifurcation of the same morpheme into 'seven' and 'north wind, north' in Russian.

In the foregoing analysis of direction words, an inquiry is first made into the cognitive manners of perception and lexicalization of directions and sides, attaching particular importance to how direction symbols had been conceptualized. The constellations and animals contain in themselves memorable visual images to help early people retain crucial

The Mankind Quarterly

information on directions and reach lexical convention. This method largely reflects the activation of symbolically based mode of direction awareness with adaptive semantic connotations. This symbolic basis in turn provides the substrate for direction nomenclature, where the cognitively adaptive references to constellations and animal symbols are utilized. Significantly, the differing meanings in the chains of idea diffusion across languages in the region are shown to have acquired an astral, zoographic, and numerical spectrum of semantic availability. This multiplicity of meanings is self-explanatory, because a constellation is a group of stars, the number of stars is seven in the Big Dipper and the Pleiades, and certain animals served to be direction symbols. For this reason, language users in diverse parts of the Eurasia shared some common characteristics in symbolization of the northern and southern directions. While early people were on the subject of referring certain celestial bodies and animals to cardinal points, they gradually habituated to convert star names and animal names into direction words. One language may retain the name of the animals as a direction symbol, and another language may translate the name into a direction word itself.

5. Conclusion

The way we locate directions in terms of the words we speak seems to be simple today. The speakers of English can use the words *east*, *south*, *west*, and *north* to denote the four directions without the slightest hesitation. However, we may ask how these words were created. In conjunction with linguistic presentation of cardinal points we have discussed the role of direction symbolism in Altaic, Sino-Tibetan, and Indo-European. For the purpose of this paper, the methods and patterns may be divided into two categories. The first type is the natural objects and phenomena such as celestial bodies and their concatenated patterns in the sky. This type of symbolism with its universal tendency has been in force in many cultures since remote antiquity. The ancients must have spent much time observing, talking and knowing about the sunrise and sunset, day-night shift, and weather changes. This concern certainly was the most prominent feature of discourse and reference to directions in everyday life of early human. This solar symbolism is best reflected in the formation of the eastern and western

designations and serves as the means through which the speakers of different languages can lexicalize a cardinal point, whether that of derivative is from the word for 'sun' or the phrase containing the word for 'sun'.

The second type is of zoographic nature. Inherently directions and animals have little in common, but ancient mythology had associated them together in setting up the former with the latter. This type of symbolism migrated across linguistic and cultural boundaries interacting with the societal need to conceptualize directions, particularly the northern direction which is much less affected by the solar factor. Therefore, the cognitive process, which led to its linguistic formation, can be followed by drawing on the linguistic strata from the various languages involved in contact and in this way reconstruct the history of the development of directional notions. Any cognitive study like this one would be inevitably comparative in nature, for one can make no finding about concepts of cardinal points in the region being either astral or zoographic or numerical without having in mind some cross-linguistic references by which they are being judged. Indeed, virtually no language has left unaffected by such a long-term interaction for centuries and millennia. The three major stocks – Altaic, Indo-European, and Sino-Tibetan – seem to have endured in isoglosses, but they all had been so heavily involved in lexical interchange that a great number of words can be found in their basic vocabulary. The Altaic zoographic designation for 'north' appears to be interacted with the Chinese symbolism in very much the same way as that in the Chinese language.

Having worked out the cognitive correlation between the direction symbols and the direction words, I would like to recapitulate the main points. The various similarities in linguistic forms, cognitive parallels and associations can be summed up in Table 4.

A directional referent could slip from one side into another without experiencing the slightest linguistic confusion for speakers of the languages concerned. With no remarkable phonetic change, each new shift superseded the previous one causing the diversity of direction words in a language group. An examination of the Altaic way of determining of cardinal directions reveals strong infusions from direction symbols. At

The Mankind Quarterly

the linguistic level, they indeed exhibit ostensive disparity, and yet, as it turns out, astonishing cognitive unity. The tempo of symbol-inspired lexical innovation for directions and sides varied according to dialects and languages at different periods of time. Probably no two language groups have exactly same basics for correlating cardinal points with the secondary directions such as front and back, left and right. In Tungusic group, the words for 'south' tend to converge with those for 'front', and likewise the words for 'north' with those for 'back'. In the Salar language, there is no such correlation at all in its linguistic presentation of cardinal points.

Depending on different cultures, cardinal directions which exist as part of cosmology may carry similar and different weights. The cross-cultural practices indicate the uses of certain directions in the range of spiritual and political rituals as well as levels of government-inspired ideology. For instance, during the Cultural Revolution in China, the political idea of 'to safeguard the east' was in great vogue simply because Mao Zedong – Chairman Mao's name – contains the word *dong* 'east'. In history, the Turks set up their tents facing the east, honored the rising sun. It is recorded that the Mongols set up their yurts facing the southeastern direction. Inside the yurts, the northeastern corner is designated for the seat of the family head, the northern side is for the head's bedding place, the eastern side is for women's space, and the western side is for men's sitting place. In contrast, the western direction linguistically aligns up with decline and even death in some languages. The strength and durability of this direction symbolism in giving rise to direction words and preferences should never be minimized.



Mirror of the Tang period, AD 618-907, showing the 'four supernatural creatures' representing the four quadrants of the heavens.
From the *Xi Qing Gu Jian* (西清古鑑)

Table 1:

The Indo-European words for 'east' and 'west'.

LANGUAGES	SOURCE WORDS
Greek <i>anatolē</i> 'east'	<i>anatellō</i> 'rise (especially of the sun)'
Latin <i>oriēs</i> 'east'	<i>oriri</i> 'rise'
Italian <i>levante</i> 'east'	<i>levare</i> 'raise, lift (refl. 'rise')'
Rumanian <i>răsărit</i> 'lit. (sun) rise'	<i>răsări</i> 'go up, climb, rise (of the sun)'
Church Slavic <i>vŕstokŭ</i> 'east'	originally 'sunrise', lit. 'a running up, out'
Greek <i>hespéra</i> 'west'	<i>hespéra</i> 'evening'
Latin <i>occidēs</i> 'west'	<i>occidere</i> 'fall down, set (of the sun)'
Italian <i>ponente</i> 'west'	<i>porre</i> 'put, place'
Rumanian <i>apus</i> 'west (lit. (sun) set)'	<i>apune</i> 'sink, set (of the sun)'
Church Slavic <i>zapadŭ</i> 'west'	<i>za-</i> 'behind' and <i>padq</i> 'fall'

Table 2:

The Chinese symbolism correlating cardinal points with animals and other entities.

DIRECTIONS	SIDES	ANIMALS	COLORS	SEASONS
east	left	dragon	green	spring
south	front	bird	scarlet	summer
west	right	tiger	white	fall
north	back	tortoise	black	winter

Table 3:

The direction words in selective Tungusic languages.

JURCHEN (I)	JURCHEN (II)	MANCHU	SIBE	EWENKE	HEZHE	GLOSS
<i>šeuwen</i> <i>tutilege</i>	<i>ǰulesi</i>	<i>dergi</i>	<i>vārhi</i>	<i>ǰōŋgida</i>	<i>ǰiki</i>	'east'
<i>šeuwen</i> <i>tuhelege</i>	<i>fulisi</i>	<i>wargi</i>	<i>dirhi</i>	<i>barānda</i>	<i>solki</i>	'west'
<i>ǰulege</i>	<i>fanti</i>	<i>ǰulergi</i>	<i>ǰulhi</i>	<i>ǰulida</i>	<i>ǰūlohi</i>	'south'
<i>fusge</i>	<i>ulti</i>	<i>amargi</i>	<i>amərhi</i>	<i>amēdu</i>	<i>ǰərhi</i>	'north'
<i>ǰulege</i>	<i>ǰule</i>	<i>ǰulergi</i>	<i>ǰulhu</i>	<i>ǰulib</i>	<i>ǰūljǰǰ</i>	'front'
<i>amula</i>	<i>amulugai</i>	<i>amala</i>	<i>amərhi</i>	<i>amēlā</i>	<i>amijǰǰ</i>	'back'
<i>hasu</i>	<i>tsu⁶</i>	<i>hashū</i>	<i>šōlǰru</i>	<i>ǰǰgin</i>	<i>ǰadzuta</i>	'left'
<i>iti</i>	<i>ǰewen</i>	<i>iči</i>	<i>išlǰ</i>	<i>ān</i>	<i>yočokta</i>	'right'

Table 4:

The correlation between the direction symbols and the direction words.

DIRECTION SYMBOLS	DIRECTION WORDS
Tajik <i>fuks</i> 'snake'	Jurchen <i>fusge</i> 'north'
Uigur <i>paka</i> 'frog, toad'	Chinese <i>pak</i> 'north'
Uigur <i>yultuz</i> 'star'	Jurchen <i>ulti</i> 'north'
Chinese <i>kui</i> 'turtle'	Mongolian <i>koin-a</i> 'north'
Chinese <i>hama</i> 'toad'	Manchu <i>amargi</i> 'north'
Mongolian <i>nam</i> 'low'	Chinese <i>nam</i> 'south'
Turikic <i>bars</i> 'tiger'	Mongolian <i>baraǰun</i> 'west, right'
Negidal <i>antaya</i> 'the blazing sun'	Jurchen <i>fanti</i> 'south'
Uigur <i>šamal</i> 'wind'	Tajik <i>šamul</i> 'north'
Latin <i>septen</i> 'seven'	Latin <i>septentriō</i> 'north'
Old Icelandic <i>siau</i> , Swedish <i>sju</i> 'seven'	Lithuanian <i>šiaurė</i> , Russian <i>sever</i> 'north'

⁶ This word is a loan from Chinese.

References

- Buck, C. D.
1988 [1949] A Dictionary of Selected Synonyms in the Principal Indo-European Languages. Chicago: University of Chicago Press.
- Carrasco, David
1998 Daily Life of the Aztecs: People of the Sun and Earth. Westport, Connecticut: Greenwood Press.
- Clauson, Gerard
1972 An Etymological Dictionary of Pre-Thirteenth-Century Turkish. London: Oxford University Press.
- Gai, Shanlin
1986 Yinshan yanhua (Petroglyphs in the Yinshan Mountains). Beijing: Wenwu chubanshe.
- Gao, Erqiang
1985 Tajik yu jianzhi (A Sketchy Grammar of the Tajik Language). Beijing: Minzu chubanshe.
- Gao, Erqiang
1996. Tajik-Han cidian (A Tajik-Chinese Dictionary). Chengdu: Sichuan minzu chubanshe.
- Griaule, Marcel
1970 Conversations with Ogotemmêli: an introduction to Dogon religious ideas. London: Oxford University Press.
- Grube, Wilhelm
1896 Die Sprache und Schrift der Jucen. Leipzig: Kommissions-Verlag von O. Harrassowitz. Reprinted 1937. Beijing (Beijing).
- Jia, Jingyan and Zhu Feng (eds).
1990 Menggu yiyu nuzhen yiu hui bian (A Collection of the Sino-Mogolian and Sino-Jurchen Glossaries). Tianjin: Tianjin guji chubanshe.
- Lin, Lianyun
1985 Salayu jianzhi (A Sketchy Grammar of the Salar Language). Beijing: Minzu chubanshe.
- Lin, Lianyun
1992 Salar-Han and Han-Salar cihui (The Salar-Chinese and Chinese-Salar Dictionary). Chengdu: Sichuan minzu chubanshe.
- Ma, Xueliang, et al.
1989 Yizu wenhua shi (The History of the Yi Culture). Shanghai: Shanghai renmin chubanshe.
- Mommsen, Theodor.
1908 The History of Rome. Vol. 1. London: Macmillan.
- Soustelle, Jacques.
1964 The Daily Life of the Aztecs: on the eve of the Spanish Conquest. Translated from the French by Patrick O'Brian. Penguin Books.
- Tenishev, E. R. ed.
1997 Sravnitel'no-istoriceskaja grammatika tjurkskikh jazykov: leksika. Moscow: Izdatel'stvo 'Nauka'.

Tsintsius, V. I. ed.

1975, 1977

Sravnitel'nyj slovar' tunguso-man'chzhurskikh jazykov: 2 Vols. Leningrad: Izdatel'stvo 'Nauka'.

Wang, Penglin

1995 Indo-European loanwords in Altaic. *Sino-Platonic Papers* 65:1-28.

Wierzbicka, Anna

1992 *Semantics, Culture, and Cognition: Universal Human Concepts in Culture-Specific Configurations*. New York: Oxford University Press.

Yuan, Wen

2003 *Ba ren zhi mi* (The puzzle of the Ba people). *Renmin ribao (haiwai ban)*, July 4, page 2.

From Grandmother's Shears to the Shield of Achilles: A Look at the European Dimension of the Finnish Folk Culture

Eero Jarva¹
University of Oulu, Finland

The author explores the earliest historical and archaeological record of shears, and uses his findings to discuss how an examination of historical period and Iron Age material culture from wide parts of Central, Eastern and Southern Europe might help to answer questions about the origins of Finnish material culture and ethnicity.

Key Words: European origin of Finnish material culture; European Iron Ages; History of agriculture; Agricultural tools; Sickles; Scissors; Scythes; Rakes; Flails; Harvest techniques; Homeric legend; Achilles Shield.

The Origins of Grandmother's Shears

Perhaps even the young generation knows what shears (Figure 1) are, whereas older people recall the shears in their context as a female instrument used especially in shearing sheep. Shears appear in Finland already among finds dated to the earlier Roman Iron Age provided with their characteristic elliptical handle.² The basic structure in shears remained relatively unchanged through time,³ although there are some time-bound features, such as the handle ending in a loop reminiscent of the Greek letter omega, a feature seemingly appearing in Finland during the Viking Period.⁴ Regarding the Viking Period finds, there is a prominent feature which differs from the recent practice: shears are found to a marked extent in male burials. It is supposed that small shears would have been used first of all as toilet implements and the greater ones for

¹ Address for correspondence: ejarva@koivu.oulu.fi

² U. Salo, *Die frühromische Zeit in Finnland* (Suomen muinaismuistoyhdistyksen aikakauskirja 67. Helsinki 1968), pp. 120-121, pl. 6,7 (Karjaa, Kroggårdsmalmen: NM [National Museum, Helsinki] 10612:9), 22,3 (Maaria, Karsämäki: NM12686:87) and 27,3 (NM 7451:3: Maaria, Saramäki); see also E. Kivikoski, *Die Eisenzeit Finnlands. Bildwerk und Text* (Finnische Altertumsgesellschaft. Helsinki 1973), table 8, no. 61 (Maaria, Saramäki: NM 7451:3).

³ See A. Hackman, *Das Brandgräberfeld von Pukkila in Isokyrö* (Suomen muinaismuistoyhdistyksen aikakauskirja 41. Helsinki 1938), pp. 156-162; J. Luoto, *Liedon Vanhanlinnan mäkilinna* (Suomen muinaismuistoyhdistyksen aikakauskirja 87. Helsinki 1984), p. 89.

⁴ See Kivikoski, p. 126, fig. 976; Luoto, p. 89.

shearing and textile working.⁵

Also in Scandinavian countries, shears are found both in male and female burials, for example, in Denmark appearing in a warrior burial dated to the first century BC.⁶ In this case we can surmise that the shears were used for haircutting, because there was also an object identified as a razor. It has been supposed that the beard and moustache of a man recently discovered near Manchester had been cut by shears.⁷ In northern Germany the shears are documented to the late La Tène Period,⁸ but in the southern parts of the continent they can be traced into the earlier La Tène Period, again discovered to a marked extent in warrior burials, which seem to have belonged to a very high social class.⁹ Even here the earliest examples are provided with a simple elliptical handle, but already during the late La Tène Period the handle is enlarged to an omega-like loop.¹⁰ It has been suggested that all Celtic shears would have been used as toilet implements.¹¹

Accordingly, in the light of the archeological evidence – composed often of rich warrior burials – the Finnish shears are connected to a common European feature, which can be traced easily to the Celtic cultural area on the northern side of the Alps. The marked masculine and military connection of the shears can be recognized also in the tombs of local Celtic tribes

⁵P.-L. Lehtosalo-Hilander, *Luistari II. The Artefacts* (Suomen muinaismuistoyhdistyksen aikakauskirja 82:2. Helsinki 1982), pp. 57-60.

⁶J. Brøndsted, *Danmarks Oldtid III. Jernalderen* (Copenhagen 1960), pp. 61, 64, Fig. of 61).

⁷I. M. Stead, "Lindowin mies: Ihmisuhri 2 000 vuoden takaa", *Etruskeista viikinkeihin (Ihminen suku 3. Honkong 1994)*, p. 196.

⁸R. Müller, *Die Grabfunde der Jastorf- und Latènezeit an unterer Saale und Mittelbe* (Berlin 1985), pp. 94-95, Fig. 13.

⁹E.g. D. van Endert, *Die Wagenbestattungen de späten Hallstattzeit und der La Tènezeit im Gebiet westlich des Rheins* (BAR International Series 355. Oxford 1987), pp. 37, pls. 18 (Early La Tène), 47-49, pl. 30,4 (Middle La Tène), 90-94, pls. 50, 52,6 (Early La Tène). Contacts continued also more recently, during the late Antiquity and the early Medieval period: M. Martin, *Das fränkische Gräberfeld von Basel-Bernerring. Mit einem anthropologischen und einem osteologischen Beitrag von R. Bay und B. Kauffmann* (Basel 1976), pp. 273-274 n:o 6 (a man), 275-278 n:o 8 (a woman); G. Behm-Blancke, *Gesellschaft und Kunst der Germanen. Die Thüringer und ihre Welt* (Dresden 1973), p. 119, Fig. p. 121.

¹⁰W. Gaitzsch, *Eiserne römische Werkzeuge. Studien zur römischen Werkzeugkunde in Italien und den nördlichen Provinzen des Imperium Romanum I-II* (BAR International Series 78. Oxford 1980), p. 212.

¹¹After G. Jacobi Gaitzschin (p. 212). I was unable to use the volume in question in this context, G. Jacobi, *Werkzeug und Gerät aus dem Oppidum von Manching* (Die Ausgrabungen in Manching 5. 1974).

in northern Italy.¹²

On the other hand, in the light of the information given by Marcus Terentius Varro,¹³ shears were introduced to the Romans by barbers (*tonsorēs*) coming from Sicily 453 years after the foundation of Rome, i.e. at about 300 BC. The author implies that before that time the wool was taken from sheep by plucking (*vellere*; > *vellus*, *vellimnum* meaning wool).¹⁴ Among our sources, it is only Calpurnius Siculus who explicitly mentions shears in working wool from sheep, warning about the danger of damaging the skin with sharp shears (*ne sit acuta forpice laesa cutis*).¹⁵ Varro's information is matched by the written information regarding the Greek world. For example, the habit of shaving followed the model given by Alexander the Great,¹⁶ although among the Romans this came later, in the second century BC.¹⁷ On the other hand, we hear from Plutarch how in Syracuse early in the fourth century BC Dionysios the elder, famous for his cruelty and suspiciousness, did not allow his hair to be cut with shears but had it burnt off!¹⁸

In addition to shearing and caring for personal hygiene, shears were used in the Roman world in various textile tasks. In fact, there were for this latter use special shears provided with long narrow blades,¹⁹ a tool type which remained in use until

¹²J. M. De Navarro, *The Finds from the Site of La Tène* (London 1972), pp. 315-316, pl. 118,14; *I galli e l'Italia* (Soprintendenza archeologica di Roma. Rome 1978), pp. 89 n:o 10, 108 n:o 323; 131-132 n:o 392. See also shears dated to the 3rd-2nd cent. BC discovered in Samnium (Monte Vairano): *Samnium. Archeologia del Molise* (ed. by S. Capini & A. Di Niro. Roma 1991), p. 174 no. d87.

¹³M. Terentius Varro, *Rerum rusticarum* II 11.10: Omnino tonsorēs in Italiam primum venisse ex Sicilia dicuntur p. R. c. a. CCCLIII, ut scriptum in publico Ardeae in litteris extat, eosque adduxisse Publium Titianum Menam. Olim tonsorēs non fuisse adsignificat antiquorum statuā, quod pleraeque habent capillum et barbā magnā. See also Pliny, *Naturalis historia* VII 59(211).

¹⁴Varro, *Rerum rusticarum* II 9.6-9.

¹⁵Calpurnius Siculus, *Eclogae* V 73-74. On the subject, see K. D. White, *Agricultural Implements of the Roman world* (Cambridge 1967), pp. 119-120.

¹⁶See e.g. Athenaios, *Deipnosophistai* XIII 565; according to Plutarch (*Theseus* V 4) Alexander ordered his generals to shave their beards, since these offered an easy hold in battle; for other sources and on the subject, see recently A.M. Prestianni Giallombardo – B. Tripodi, "Iconografia monetale e ideologia reale macedone: i tipi del cavaliere nella monetazione di Alessandro I e di Filippo II", *Revue des Études anciennes* 98(1996), p. 338 and n. 147.

¹⁷Plinius, *Naturalis historia* VII 59(211). About this topic, see also J. Carcopino, *Daily Life in Ancient Rome* (London 1970), p. 178.

¹⁸Plutarkhos, *Dion* IX 3.

¹⁹Gaizsch, pp. 213-216, fig. 38 and pl. 72 no. 319.

the 19th century.²⁰ Moreover, glassblowers seem to have had special shears at hand²¹ and physicians had surgical shears.²² Moreover, Columella says that shears were used for cutting off defective grapes.²³

What about the history of shears in the Greek world? As already seen, the written evidence implies that they were used in Magna Graecia in the first half of the fourth century at the latest. This is now confirmed archeologically by the discovery of a pair of shears in a burial datable to the beginning of this century at Metapontum.²⁴

Coming to mainland Greece, excavations in the Kerameikos cemetery in Athens have revealed a tomb dated to the mid-4th century or a little earlier and attributed to a young woman, containing small shears.²⁵ Another find of shears comes from a 3rd century BC burial and may belong to a man because it contained a scraper (conventionally called *strigilis*), too.²⁶

Furthermore, representations in Greek art witness that shears would have been used early in the fifth century at the latest, but possibly already in the sixth century BC. Possibly there is indirect evidence about the use of shears in Greece in artistic representations which suggest that at least after the mid-6th century BC men would have had shorter hair than earlier and that they would have trimmed their beards carefully.²⁷ Such

²⁰A. Patterson, "Spinning and weaving", *A History of Technology II* (Oxford 1972), p. 217, figs. 185, 190. Such shears, e.g. in the Pulkila local museum (Finland) are more than one meter long: *Kaleva* 22.7.97.

²¹J. Price, "Glass", *Roman Crafts* (ed. by D. Strong & D. Brown. Duckworth 1976), p. 117, fig. 207. About shears of modern glassblowers, see D.B. Harden, "Glass and Glazes", *A History of Technology II* (Oxford 1972), p. 331 figs 311-312.

²²L. J. Bliquez, *Roman Surgical Instruments and Other Minor Object in the National Archaeological Museum of Naples* (Mainz 1994), p. 38 cat. no. 58 (with a reference to small shears – 9.8 cm long – discovered at Pompei).

²³Columella, *De re rustica* XII 44.4: *Alii cum legerunt uvam, siqua sunt in ea vitiosa grana forficibus amputant* –; see also Pliny, *Naturalis Historia* XV 62.

²⁴M. Prohászka, *Reflections from the Dead. The Metal Finds from the Pantanello Necropolis at Metaponto. A Comprehensive Study of Grave Goods from the 5th to the 3rd Centuries B.C.* (Studies in Mediterranean Archaeology CX. Jonserod 1995), pp. 113-114, 137-138.

²⁵W. K. Kovacovics, *Die Eckterasse (Kerameikos. Ergebnisse der Ausgrabungen XIV. Berlin 1990)*, pp. 16-17 n:o 9, Fig. 30.

²⁶Kovacovics, p. 87 n:o 2, pl. 48. For the appearance of scrapers in female burials, see Prohászka, p. 185.

²⁷See e.g. J. Boardman, *Greek Sculpture. The Archaic Period, a Handbook* (Norwich 1978), Figs 113-114. About vase-paintings, see J. Boardman, *Athenian Black Figure Vases, a Handbook* (Norwich 1974), passim. Compare with O.Gigon, *Die Kultur der Griechen* (a reprint of "Handbuch der Kulturgeschichte". Frankfurt am Main 1973),

trimming, which can be seen also in the case of horse manes,²⁸ was naturally easier using shears than by a razor or some other tool like the sword which can be seen in some ritual connections.²⁹ We know that later those having long hair could be despised: according to Aristotle the famous 5th-century architect Hippodamos of Miletos went too far in having long hair, using expensive jewelry and using the same cheap clothing both in the winter and summertime.³⁰ Furthermore, there are two terracotta groups dated to the beginning of the 5th century and representing a barber at work:³¹ he handles a symmetric tool which can be recognized as shears.

Although it has been suggested that the shears were a Celtic innovation,³² it seems rather possible that the origin of the shears would be located somewhere in the Semitic world as Forbes has maintained. According to him, during the Bronze Age it was typical to gather wool by plucking and that only the introduction of iron made possible the invention of shears.³³ At the moment, I do not know decisive evidence for this theory, but it is noteworthy that some fragmentary shears discovered in the

pp. 146-147, where the short-haired fashion is dated to the 5th century BC.

²⁸E. Jarva, *Archaologia on Archaic Greek Body Armour* (Studia Archaeologica Septentrionalia 3. Rovaniemi 1995), p. 56.

²⁹J. Boardman, *Athenian Red Figure Vases. The Archaic Period, a Handbook* (Norwich 1975), figs 331 and 361; J.D. Beazley, *The Kleophrades Painter* (Bilder griechischer Vasen 6. Berlin 1933, repr. Mainz 1974), pl. 32. Homer's heroes cut off their hair as a sign of sorrow: *Odyssey* XXIV 45-46.

³⁰Aristotle, *Politika* II 8; on the subject, see recently V.B. Gorman, "Aristotle's Hippodamos (*Politics* 2.1267b22-30)", *Historia* 44(1995), pp. 389-395 with references.

³¹Boston, Museum of Fine Arts: for example, G.M.A. Richter, *A Handbook of Greek Art* (7th edition. Wien 1974), fig. 336; Berlin (East-), Staatlichen Museen 6683b: R. Higgins, *Tanagra and the Figurines* (London.), 90, Fig. 95.

³²See Kovacs, p. 87. Cf. W. M. Flinders Petrie, *Tools and Weapons Illustrated by the Egyptian Collection in University College, London, and 2,000 outlines from Other Sources* (British School of Archaeology in Egypt and Egyptian Research Accounts. Twenty-Second Year, 1916. London 1917), p. 48 stating that "Shears appear to have been of Italian invention, at about 300 B.C."; also A.G. Drachmann, *Antikens teknik. Om den västerländska civilisationens första tekniska hjälpmedel* (Stockholm 1988 [orig. edition 1963]), p. 32 arguing that use of shears for sheep shearing was a Roman invention.

³³R. J. Forbes, *Studies in Ancient Technology* IV (Leiden 1964), p. 8. Shears made of bronze are relatively rare. See, however, G. Schwantes, *Deutschlands Urgeschichte* (7th edition. Stuttgart 1952), fig. 203. On the subject, see also B. Bunch - A. Helleman, *The Timetables of Technology. A Chronology of the Most Important Peoples and Events in the History of Technology* (New York - London etc. 1993), p. 51 (Tools & devices).

Black Sea area have been dated to circa 6th-4th centuries BC.³⁴

Ordinary scissors, too, have a long cultural history. It seems that prehistoric scissors are not yet known in Finland, but it is probable that even here they would have been introduced at the latest in the 13th century AD. In continental Europe, however, use of scissors was known half a millennium earlier.³⁵ Even Romans used scissors, especially barbers, but they are relatively rare among archeological finds. The central technical solution in the scissors was the rivet connecting the blades and forming like a lever, a mechanism which was utilized much earlier in the tongs of blacksmiths.³⁶ Scissors were used at least in cutting leather and probably also metal sheet.³⁷ The origin of scissors may well have been in the Roman world, but it may be diagnostic that we know them at this time from the old Greek city of Priene and from the old Lydian capital of Sardis,³⁸ a place from which some odd half a millennium earlier started another significant innovation, the metal coin.³⁹

The European Dimension of the Finnish Folk Culture

Now, it is relevant to put forward a question whether the above innovation process has some more general significance. Is it only a single detail which happens to have a common European background? Is it possible that the Finnish folk culture contains elements which form a parallel to several manifestations in the sphere of the intellectual culture, such as our democratic mode of administration, the roots of which can be traced to Athens as well as our educational system, the cradle

³⁴G. R. Tsetskhladze, "Did the Greeks go to Colchis for Metals?", *Oxford Journal of Archaeology* 14(1995), p. 326 Fig. 18.

³⁵E. M. Jope, "Agricultural implements", *A History of Technology II. The Mediterranean Civilizations and the Middle Ages c. 700 B.C. to c. A.D. 1500* (Oxford 1972), p. 100.

³⁶This is the reason behind the terminological relationship between blacksmiths scissors and tongs, which Bishop of Sevilla, Isidorus, thought about in the early 7th century in his *Etymologiarum sive originum* (XX 13.3): *Forfices: secundum etymologiam, si a filo dicuntur, F ponitur, ut forfices quae sunt sartorum; si a pilo, P, ut forpices quae sunt tonsorum; si ab accipiendo, C, ut forcipes, eo quod formum capiant, quae sunt fabrorum.*

³⁷Gaitzsch, pp. 216-219.

³⁸See e.g. the burial find from Priene in Berlin: *Antikenmuseum Berlin. Die ausgestellten Werke* (Landshut 1988), pp. 192-193; also Gaitzsch, n. 488. Dating of the (surgical?) scissors from Sardis to the Roman period is, however, problematic: J. C. Waldbaum, *Metalwork from Sardis: the Finds through 1974* (Archaeological Exploration of Sardis 8. Cambridge, Mass. - London 1983), p. 62 n:o 239, pl. 17.

³⁹See. Herodotos, *Historiai* I 94.

of which is naturally the Academy of Plato in Athens? Also worthy of interest is the possibility that the origin of shears should be sought through the Greco-Roman culture to the earlier civilizations in the east similarly to some phenomena such as the Christian religion, which is a classical example.

In fact it is easily demonstrated on a general level that the history of shears is by no means a singular case, although perhaps no exact parallel case can be pointed to in the material culture. Generally taken, this kind of approach is not very common in Finland. However, some scholars have paid attention to the roots of the phenomena in our folk culture and the Iron Age culture. For example, Teppo Korhonen has shown that the water mill in Kainuu reflects a common European tradition which partly goes beyond that.⁴⁰ Unto Salo, again, has followed the origins of Finnish wooden vessels⁴¹ and Leena Sammallahti has found out that the earliest 'foremother' of the Finnish cradle has been discovered at Herculaneum destroyed in 79 AD.⁴² It is also worthy of note how Marta Hoffmann has shown that among the Skolt Lapp women emigrated from Petsamo there was still in the 1950s a living tradition of using warp-weighted looms in making the *raanu*, a tradition representing thousands of years of European history in making textiles.⁴³

In fact, a look at the Finnish ethnological material shows that there are lots of things provided with a cultural history similar to that of the shears. The following things serve as unsystematic examples to demonstrate their potential value as well as to test the above discussed cultural history of the shears and the underlying significance.

To begin with, the above-mentioned 'tongs of blacksmiths, the type used still in present-day Finland, were probably introduced here during the Iron Age, whereas in Denmark the

⁴⁰T. Korhonen, *Vesimyllyt. Historia, rakenne, käyttö ja kunnostus erityisesti kainuulaisen myllyperinteen valossa* (Kainuun museon julkaisu). Vammala 1993.

⁴¹U. Salo, "Astian kulttuurihistoriaa Suomessa ja naapurialueilla", *Suomen Museo* 96(1989), pp. 5-48.

⁴²L. Sammallahti, *Suomalainen kansanomaisen jalaskehto* (Kansatieteellinen arkisto 31). Helsinki 1980.

⁴³M. Hoffmann, *The Warp-Weighted Loom. Studies in the History and Technology of an Ancient Implement*. Oslo 1974. We can add here that Finland was more closely a part of the cultural tradition of Antiquity than previously thought because a pyramid-shaped loom-weight has been discovered from Vanhalinna at Lieto: Luoto, pp. 131 and 235 (ÖBA).

tongs are known from Roman Iron Age contexts.⁴⁴ In an Etruscan city at Marzabotto near Bologna, a pair of tongs has been discovered in a context datable to the 5th century BC,⁴⁵ and in Greek art they are pictured in the beginning of the 5th century.⁴⁶ However, this evidence is late because the tongs must have been introduced at the latest with the use of iron, and in fact the 'fire-fings' are recorded both in the Homeric *Iliad* and *Odyssey*.⁴⁷

The tongs are not the only tool of blacksmiths having this kind of cultural history. It suffices to mention that the tool used by 20th century Finnish blacksmiths in making metal wire was the same as that used by their forefathers, perhaps already in prehistoric times.⁴⁸ Such wire-drawing tools are dated to the Viking Period at Haithabu,⁴⁹ and in the above-mentioned Etruscan site of Marzabotto to the 5th century BC.⁵⁰

Regarding tools used in carpentry, we have the same situation in many cases. Thus, for example, the carpenter's plane finds its prototype in the Roman world,⁵¹ as well as the traditional wood frame saw called *nälkäviulu* ('hunger violin').⁵²

Agricultural tools used in Finland show several European features. It is clear, for example, that the simple hook plough used during the Iron Age represents a southern cultural loan. Perhaps less known is the history of the brushwood harrow (*risuäes*), but Veikko Anttila has suggested that the type dominating in western Finland would belong to an old [i.e. Early Iron Age] Baltic-Finnish-Scandinavian cultural complex and that the eastern type would have been introduced in the

⁴⁴Brøndsted, p. 250.

⁴⁵*Gli etruschi e Europa* (Milano 1992), p. 111 no. 9.

⁴⁶A known example is the so-called Keyside Glass vine vessel (oinokhoe): London, British Museum B507; Boardman, *Black Figure Vases*, Fig. 285; see also Fig. 277.

⁴⁷Respectively Homer, *Iliad* XVIII 477; *Odyssey* III 434. On the subject, see R. J. Forbes, *Bergbau, Steinbruchtätigkeit und Hüttenwesen* (Archaeologica Homerica II:K. Göttingen 1967), p. 15.

⁴⁸See Kivikoski, p. 148, Fig. 1239.

⁴⁹F. K. Naumann, "Metallkundliche Untersuchungen an drei wikingerzeitlichen Zieheisen aus Haithabu", *Untersuchungen zur Technologie des Eisens* (Berichte über die Ausgrabungen in Haithabu 5. Neumünster 1971), pp. 84-99. On the subject, see R. F. Tylecote, *The Early History of Metallurgy in Europe* (London - New York 1987), pp. 269-271.

⁵⁰*Gli etruschi e Europa*, p. 111 no. 8. Naturally also anvils and their nail-making holes are equivalent phenomena.

⁵¹Gaitsch, pp. 103-107, 110-115.

⁵²Gaitsch, pp. 181-208.

12th century AD from the Slavic people.⁵³ However, it seems possible that the roots of this primitive agricultural implement could go deeper into Europe, perhaps to the Roman tool described by the Roman writer Varro (116-27 BC) in his *De lingua latina: Irpices regula compluribus dentibus, quam item ut plaustrum boves trahunt* ("Irpices 'harrows' are a straight piece of wood with many teeth, which oxen draw just like a wagon" [Loeb transl.]).⁵⁴

Possibly the earliest rake known in Finland is represented by carbonized remains from the village of Kainuunkylä in Ylitornio and dated to the 13-14th centuries AD.⁵⁵ In southern Scandinavia, however, there are rakes dated to the Pre-Roman Period.⁵⁶ Approximately contemporary is the description of Varro (*De lingua latina* V 136) saying: *Rastrelli ut irpices serrae leves; itaque homo in pratis per fenisecia eo festucas corradit, quo ab rasu rastrelli dicti* ("Rastrelli 'hay rakes', like harrows, are saw-toothed instruments, but light in weight; therefore a man in the meadows at haying time *corradit* 'scrapes together' with this the stalks, from which *rasus* 'scraping' they are called *rastrelli*." [Loeb transl.]). Columella, again, mentions explicitly rakes made of wood.⁵⁷ Archeological evidence from the classical world seems to be somewhat older.⁵⁸

Also the tools used in Finland in hay making and harvesting during the 20th century have obvious connections to the common European tradition. Of special interest are sickles because in them one can distinguish both eastern and western features. It is often problematic to classify early Iron Age sickle

⁵³V. Anttila, *Äes Suomessa* (Suomi 114:1. Helsinki 1968), pp. 19-23.

⁵⁴Varro, *De lingua latina* V 136. On the subject, see White, *Agricultural Implements*, pp. 148-151.

⁵⁵P. Koivunen, "Leikkauskoristeinen, hiiltynyt harava Peräpohjolasta", *Baskerilinja. Unto Salo 60 vuotta* (Vammala 1988), pp. 91-109.

⁵⁶J. Granlund, "Räfsa", *Kulturhistorisk Leksikon för nordisk middelalder fra vikingetid til reformationstid* 14 (2nd edition. Viborg 1982), cols. 584-586; See also a well-preserved Roman Iron Age Period rake from Torsbjerg, Denmark: Brøndsted, p. 244, Fig. p. 243. About rake typology, dating, and use, see B. Stoklund, "Ethnological Interpretations of Implements. The Hayrake as an Example", *Ethnologia Europaea* 20(1990), pp. 5-14.

⁵⁷Columella, II 10.27; II 12.6. On the subject, with references to other ancient sources, see White, *Agricultural Implements*, pp. 56-57.

⁵⁸Probably a rake has been represented in an Iron Age rock drawing which should not be later than the 6th century BC: R. Poggiani Keller – A. Fossati, "Parco delle Incisioni Rupestri di Grosio (Sondria)", *Italia padana e centro-alpina* (Preistoria e Protostoria in Italia. Guide archeologiche 5. Forlì 1995), p. 241.

finds, especially with reference to the better known typology to be discussed below. Anyway, it is possible to trace this tool in Finland as early as the shift between the Pre-Roman and the Early Roman Iron Age.⁵⁹

Manninen has distinguished between three different sickle types in Finland in the beginning of the this century, types *a-c*.⁶⁰ The sickle type *a*, the most often met in Finland, has a form like a question-mark with the handle shaft bent backwards. According to ethnologists it was introduced into Finland in the 12th century AD through the Karelian Isthmus, originating in Novgorod, and together with it came as a loan-word from old Russian its name, *sirppi*.⁶¹ This 'eastern' sickle is known also in Estonia, Lithuania, Poland and towards the Southwest in Sweden and Norway. The view taken by Kustaa Vilks that it would have been adopted through Finland to Scandinavia⁶² has not been generally accepted.⁶³ In any case this type, called also a balanced sickle, has been regarded as a notable technical innovation in the Roman world, because it was ergonomically more advanced than the sickle provided with a simple arch only.⁶⁴ It has been estimated that the balanced sickle would have been introduced in Europe first somewhere on the north side of the Alps, in the regions of Switzerland and Hungary about the 4th century BC, although its proper origin would be in the Middle East.⁶⁵

The Finnish sickle type *b* is also called *pivosirppi*, for which a quite long and straight shaft fastened by riveting to the blade is characteristic, the ending of which is reminiscent of a snout. It is

⁵⁹U. Salo, *Die frühromische Zeit in Finnland* (SMYA 67. Vammala 1968); Kivikoski, p. 26, fig. 63; also U. Salo, "Suomen varhaisimmat sirpit", *Kotiseutu* 1972/4-5, p. 157-160 with a survey of flint predecessors of the iron sickles.

⁶⁰I. Manninen, "Maanviljelys. Heinänteko", *Suomen suku* III (Helsinki 1934), p. 122-124.

⁶¹K. Vilks, "Zur Geschichte der finnischen Sichel", *Suomen muinaismuistoyhdistyksen aikakauskirja* 40 (1934), p. 223-235; idem, *Varsinaissuomalaisen kansanomaista taloudesta. Kansatieteellinen tutkimus* (Porvoo 1935), p. 105-108; idem, "Sirpit", *Suomen kansankulttuurin kartasto* 1. Aineellinen kulttuuri (T. Vuorela, ed. Helsinki 1976), p. 42.

⁶²Vilks, *Geschichte*, p. 229.

⁶³See R. Ahlback, *Kulturgeografiska kartor över Svenskfinland* (Skrifter utgivna av Svenska litteratursällskapet i Finland 300. Folklivsstudier utgivna genom folk kultursarkivet I. Helsingfors 1945), p. 42.

⁶⁴White, *Agricultural Implements*, p. 80 with references; idem, *Greek and Roman Technology* (London 1986), p. 28-29, 49-50, fig. 15.

⁶⁵Joep, *Implements*, p. 95.

mostly known from the western parts of 'Finland Proper' (*Varsinais-Suomi*), although it is met also in Uusimaa, southern Häme and up to the limits of the province of Oulu in Ostrobothnia. It has been suggested that the type would have come from the west through Sweden, because close parallels are known from southern Sweden and Denmark⁶⁶ where a sickle still having its shaft has been dated to the Roman Iron Age.⁶⁷ Considering that there is a lot of variation in the blade, it is probable that type *b* would reflect common European models because before the introduction of the 'balanced' sickle the handle departed directly from the root of the blade.

The third sickle type *c*, manifested in Finland, is called *kampi/kamppi*, which is also characterized as a mowing or *haka*-sickle (*niitto- eli hakasirppi*).⁶⁸ The type is known also on the south side of the Gulf of Finland,⁶⁹ and it is characteristic that its riveted handle forms a bend backwards, so that its general appearance is that of type *a*, being, however, notably greater in size. The name *kampi* refers explicitly to that specific feature of the handle. Kustaa Vilkuna has suggested a Finnish origin to the word *kamppi*,⁷⁰ but linguists have referred to outside models, considering possible both Baltic and Slav as well as Germanic origin.⁷¹ It is problematic whether the *kampi* sickle can be traced beyond the near neighboring areas, but it is evident that there is a close relation to the crooked shaft scythes used both in Finland and elsewhere.⁷²

It is probably a coincidence that the *kampi* sickle finds etymological correlation in ancient Greece: *kampi* means the same in Finnish as 'käyrä' which is in Greek *kampe*. Furthermore, it is probably a coincidence that in the Homeric *Odyssey* a sickle (*drepanon*) is defined as *eukampes*, i.e. 'beautifully bent'. We can

⁶⁶Vilkuna, *Geschichte*, p. 226.

⁶⁷Brøndsted, p. 243.

⁶⁸Vilkuna, *Varsinaissuomalaisen*, p. 106-108.

⁶⁹Vilkuna, *Geschichte*, p. 226.

⁷⁰Vilkuna, *Sirpit*, p. 42 ("Kamppi lienee omaperäinen sana."); see also idem, *Geschichte*, p. 234.

⁷¹Y. H. Toivonen, *Suomen kielen etymologinen sanakirja I* (2nd edition. Helsinki 1974), p. 154; *Lexikon der älteren germanischen Lehnwörter in den ostseefinnischen Sprachen II: K-O* (toim. S.-L. Hahmo, T. Hofstra, O. Nikkilä. Amsterdam 1996), p. 34.

⁷²On the other hand, we must note that the small-sized *kampi*-scythes recognized among finds from the Iron Age graves in Luistari (Lehtosalo-Hilander, p. 57, Fig. 17i) had the same function as the balanced sickle.

add to this imaginary chain of chances that the *eukampes* sickle of the *Odyssey* is used for mowing hay, which is probably the reason that in the Finnish translation we read in this context of scythe, which, however, is a later invention according to the present state of research.⁷³ In any case, ancient implements used in mowing hay are interesting in this connection. Namely, we know from Pliny that Romans had two types of scythes: one short-handled characterized as Italian (*Italicum brevisius*) and one long-handled connected to Roman Gallia.⁷⁴ There is no doubt that the Roman long-handled scythe, which could be provided with a blade more than 1.5 m long,⁷⁵ is a precursor of modern scythes; those of the Romans were probably straight, but at least in the eighth century its effectiveness was increased by a backward-curving handle, and not later than the twelfth century by adding a bar-handle.⁷⁶ Regarding the Roman short-handled scythe, it seems tempting to connect it to our 'national' *kampi*.

The above imaginary connections to ancient Greece recalls to a suspicious extent the old theories according to which the European peoples – the Finns included – could trace their origins to Japhet, the son of Noah and his descendants. However, old connections between the Finnish folk culture and the Mediterranean culture are not only humbug. I limit myself to refer to the well-known Homeric description of the shield of Achilles from the 8th century BC where we meet a 'national Finnish' picture of harvesting:⁷⁷

Therein he set also a king's demesne-land, wherein labourers were reaping, bearing sharp sickles in their hands. Some handfuls were falling in rows to the ground along the swathe, while others the binders of sheaves were binding with twisted ropes of straw. Three binders stood hard by them, while behind them boys would gather the handfuls, and bearing them in their arms would busily give them to the binders; and among them the king, staff in hand was standing in silence at the swathe, joying in his heart. (Loeb transl.)

⁷³Homer, *Odyssey* XVIII 367-368. On the subject, see S. Isager & J.E. Skydsgaard *Ancient Greek Agriculture. An Introduction* (London – New York 1992 and 1995), p. 52.

⁷⁴Pliny, *Naturalis Historia* XVIII 261.

⁷⁵See especially White, *Agricultural Implements*, pl. 9; idem, *Roman Farming*, pl. 39-40.

⁷⁶White, *Agricultural Implements*, p. 99-100.

⁷⁷Homer, *Iliad* XVIII 550-557. On the subject, see K. Fittschen, *Der Schild des Achilleus* (Archaeologica Homerica II:N. Bildkunst, teil 1. Göttingen 1973).

The Homeric 'Finnish national' harvesting scene is by no means a coincidence like the above curious etymology around the sickle. Reaping the crops into sheaves (*lyhtee*) is common in medieval Europe. Likewise it is noteworthy that the habit of using jointed flails (*varstat*) in threshing was common in Europe during the Medieval period and it is probable that already in the Late Antiquity flails were used for this purpose, at least in Roman Gallia.⁷⁸ In this connection, however, I take the opportunity to remind that at least according to Kustaa Vilkkuna not all in threshing technology is imported: "Riihi is one of the most ancient and brilliant innovations made by Finns."⁷⁹

The Formation of Nations

It is probable that the above features signify mostly the introduction of only material culture in Finland. However, they serve as indicators of the directions towards which Finnish culture was oriented which characterize its nature. One of the Finnish proverbs – which are mostly the same in general in the other European countries – says, "Who ploughs with oxen, speaks of oxen. [Joka härillä kyntää, se häristä puhuu.]"⁸⁰ though the Euro-Asian oxen culture has had relatively little impact in our country.⁸¹

On the other hand, the introduction of some innovations probably has meant the coming of new elements to the population because, for example, the adoption of iron technology must have involved 'contact teaching'.⁸² It is well known that such professional teaching was common during the historical period.⁸³ It is not possible to estimate here the possible

⁷⁸Jope, p. 97, Fig. 65.

⁷⁹K. Vilkkuna, *Isien työ. Veden ja maan viljaa, arkityön kauneutta* (5th edition. Keuruu 1978), p. 220.

⁸⁰About possible biblical roots of this proverb, see *Lentävien lauseiden kirja* (ed. by H. Sinnemäki. Suomen kielen sanakirjat 5. Keuruu 1982), p. 142.

⁸¹On the subject, see K. Vilkkuna, *Varsinaissuomalaisten*, p. 126-151; also L. Posti, "Vehmaro ja kysymys itämerensuomalaisten vetohärkäkulttuurin iästä", *Kotiseutu* 1972/4-5, p. 153-156 tracing the roots of the oxen culture to the Baltic contacts and to the beginnings of proper cultivation of fields.

⁸²On the question of innovations, see E. Jarva, "Identiteetistä, innovaatioista, immigranteista", *Muinaistutkija* 4/1998, pp. 2-10.

⁸³One example regards the 'forefathers' of Finnish veterinary surgeons: I. Alitalo, "Kengityssepät – eläinlääkärien edeltäjät", *Hippokrates* 5(1988), p.: *Hans Höyler*, A horse-shoer smith became the master of Suutari house in Topenon village in Loppi in the beginning of the 18th century by marrying the mistress of the house. His name and the story indicate that he was of German extraction. He took care of all of the animals of the village and, therefore, functioned as a kind of district

genetic implications of such contacts, but I think it is useful to note that the size of the population living in Finland during the Early Iron Age was very small, perhaps at maximum some tens of thousands, which means that immigration of even small groups would have had some effect.⁸⁴

Accordingly the study of the material culture of the historical period and the Iron Age makes a contribution in searching the roots of the Finnish people, especially if we ask the question "How has the Finnish people formed?", instead of asking "From where have the Finns come?". Studying 'formation' has proved to be a fruitful approach in trying to solve the roots of the Etruscans,⁸⁵ who are generally regarded as an enigmatic people. In any case, I think that for future research the material culture of the historical period and of the Iron Age offers an interesting basis in trying to define the 'the European dimension' of the Finnish people – to use one of the political slogans of the day. Maybe there is some archeological evidence

veterinary. Hans Höyer died in 1768. His offspring did not continue the blacksmith and the family name. The family line still lives in Loppi, and it is widespread elsewhere in southern Finland. Another case, and no doubt more significant, is that of foreign specialists – mainly Swedish and German – who came to Finland between the 17th and 19th centuries to work in the glass industry on many localities, among which Impilahti is notable with its 125 foreign workers of its 600 odd total: see J. Heinonen – O. Vuoristo, *Antiikkikirja* (8th edition. Helsinki 1993) p. 221. An interesting case is also that of the Vallons who came to work in iron industry, being immanent both in the Finnish- and Swedish-speaking populations in Finland, among them the Olympic victor Eero Mäntyranta! On the Vallons in the Tornio Valley, see) S. Paulahju, *Vanhaa Lappia ja Peräpohjaa* [Porvoo 1923, 2th edition 1963], pp. 49-64; P. Peura, "Köngäsen ruukki ja Kaaranneksen masuuni", *Faravid* 11(1987), pp. 279-289 (esp. 284-285).

⁸⁴The Stone Age settlement of Finland composed at most of few tens of thousands of inhabitants. About the topic, see M. Nuñez, "On the Food Resources Available to Man in the Stone Age Finland", *Finskt Museum* 97 (1990), p. 49 with references. On the effects of the invading groups, see M. Mäkiuot, "Idän ja lännen välissä. Pohjois-Suomi itäisen ja läntisen kulttuurin kohtaamisalueena vanhemmalla rautakaudella", *Kulttuurien kosketus, törmäys ja yhteys* (Historian ja yhteiskuntaopin opettajien vuosikirja XXIV. Oulu 1997), p. 66.

⁸⁵M. Pallottino, *Etruscologia* (6th edition. Milan 1977), pp. 111-113. It is clear that the nation state idea is at the background of Pallottino's theory, therefore, some kind of nationalism. S. von Rede ("Archäologie und Politik: Die Geburt der Pallottino These", *Talanta. Proceedings of the Dutch Archaeological and Historical Society* 26-27[1994-1995], pp. 49-57) has presented recently that Pallottino's theories emerged as a kind of defense against the main ideology of the National Socialism in Alfred Rosenberg's *Der Mythos des 20. Jahrhunderts* (Berlin 1930), which became "the Bible" of the movement, because this caused a dirty stain in the picture of the ancient Rome used as a shield by Mussolini especially because the book placed the Etruscans in bad light from the point of view of the race theory. This was by no means acceptable for Mussolini because the *fascis* (a bundle of whips) of the Romans adopted as the fascist symbol originated from the Etruscans.

The Mankind Quarterly

also in the old 'freezer' discovered earlier by the linguists!

References

Ancient authors

- Aristotle, *Politika*
 Athenaios, *Deipnosophistai*
 Calpurnius Siculus, *Eclogae*
 Columella, *De re rustica*
 Herodotos, *Historiai*
 Homer, *Iliad*
 Homer, *Odyssey*
 Isidorus, *Etymologiarum sive originum*
 Pliny, *Naturalis historia*
 Plutarch, *Dion*
 M. Terentius Varro, *Rerum rusticarum*

Modern studies

Ahlbäck, R.

- 1945 *Kulturgeografiska kartor över Svenskfinland* (Skrifter utgivna av Svenska litteratursällskapet i Finland 300. Folklivsstudier utgivna genom folkkultursarkivet I. Helsinki).

Alitalo, I.

- 1988 "Kengityssepät – eläinlääkärien edeltäjät", *Hippokrates* 5, pp. 119-123.

Antikenmuseum Berlin.

- 1998 *Die ausgestellten Werke*. Landshut 1988

Behm-Blancke, G.

- 1973 *Gesellschaft und Kunst der Germanen. Die Thüringer und ihre Welt* (Dresden).

Boardman, J.

- 1974 *Athenian Black Figure Vases, a Handbook* (Norwich).
 1975 *Athenian Red Figure Vases. The Archaic Period, a Handbook* (Norwich).
 1978 *Greek Sculpture. The Archaic Period, a Handbook* (Norwich).

Brøndsted, J.

- 1960 *Danmarks Oldtid III. Jernalderen* (Copenhagen).

Carcopino, J.

- 1970 *Daily Life in Ancient Rome* (London).

Drachmann, A. G.

- 1988 *Antikens teknik. Om den västerländska civilisationens första tekniska hjälpmedel* (Stockholm [orig. edition 1963])

van Endert, D.

- 1987 *Die Wagenbestattungen der späten Hallstattzeit und der La Tènezeit im Gebiet westlich des Rheins* (BAR International Series 355. Oxford).

Fittschen, K.

- 1973 *Der Schild des Achilleus* (Archaeologica Homerica II:N. Bildkunst, teil I. Göttingen).

- Forbes, R. J.
1964 *Studies in Ancient Technology* IV (Leiden).
- Gigon, O.
1973 *Die Kultur der Griechen* (eripainos teoksesta "Handbuch der Kulturgeschichte". Frankfurt am Main).
- Gaitzsch, W.
1980 *Eiserne römische Werkzeuge. Studien zur römischen Werkzeugkunde in Italien und den nördlichen Provinzen des Imperium Romanum* I-II (BAR International Series 78. Oxford).
- Granlund, J.
1982 "Räfsa", *Kulturhistorisk Leksikon for nordisk middelalder fra vikingetid til reformationstid* 14 (2nd edition. Viborg), columns 584-586.
- Hackman, A.
1938 *Das Brandgräberfeld von Pukkila in Isokyrö* (Suomen muinaismuistoyhdistyksen aikakauskirja 41. Helsinki).
- Hahmo, S.-L., T. Hofstra, O. Nikkilä, ed. by
1996 *Lexikon der älteren germanischen Lehnwörter in den ostseefinnischen Sprachen* II: K-O. Amsterdam
- Harden, D. B.
1972 "Glass and Glazes", *A History of Technology* II (Oxford), pp. 311-346.
- Higgins, R.
Tanagra and the Figurines (London s.a.).
- Hoffmann, M.
1974 *The Warp-Weighted Loom. Studies in the History and Technology of an Ancient Implement*. Oslo.
- Isager, S. & J.E. Skydsgeard
1992 ja 1995
Ancient Greek Agriculture. An Introduction (London – New York).
- Jarva, E.
1995 *Archaologia on Archaic Greek Body Armour* (Studia Archaeologica Septentrionalia 3. Rovaniemi).
1998 "Identiteetistä, innovaatioista, immigranteista", *Muinaistutkija* 4, pp. 2-10.
- Jope, E. M.
1972 "Agricultural Implements", *A History of Technology* II. *The Mediterranean Civilizations and the Middle Ages c. 700 B.C. to c. A.D. 1500* (Oxford), pp. 81-102.
- Kivikoski, E.
1973 *Die Eisenzeit Finnlands. Bildwerk und Text* (Finnische Altertumsgesellschaft. Helsinki).
- Koivunen, P.
1988 "Leikkauskoristeinen, hiiltynyt harava Peräpohjolasta", *Baskerilinja. Unto Salo 60 vuotta* (Vammala), pp. 91-109.
- Korhonen, T.
1993 *Vesimyllyt. Historia, rakenne, käyttö ja kunnostus erityisesti kainuulaisen myllyperinteen valossa* (Kainuun museon julkaisu). Vammala.
- Kovacsics, W. K.
1990 *Die Eckterasse* (Kerameikos. Ergebnisse der Ausgrabungen XIV. Berliini).

Lehtosalo-Hilander, P.-L.

- 1982 *Luistari II. The Artefacts* (Suomen muinaismuistoyhdistyksen aikakauskirja 82:2. Helsinki).

Luoto, J.

- 1984 *Liedon Vanhanlinnan mäkilinna* (Suomen muinaismuistoyhdistyksen aikakauskirja 87. Helsinki).

Manninen, I.

- 1934 "Maanviljelys. Heinänteko", *Suomen suku* III (Helsinki), pp. 97-138.

Martin, M.

- 1976 *Das fränkische Gräberfeld von Basel-Bernerring. Mit einem anthropologischen und einem osteologischen Beitrag* von R. Bay und B. Kauffmann (Basel).

Milan 1992

- 1977 1992 *Gli etruschi e Europa*

Müller, R.

- 1985 *Die Grabfunde der Jastorf- und Latènezeit an unterer Saale und Mittelbe* (Berliini).

Núñez, M.

- 1990 "On the Food Resources Available to Man in the Stone Age Finland", *Finsk Museum* 97, pp. 24-54.

De Navarro, J. M.

- 1972 *The Finds from the Site of La Tène* (London).

Pallottino, M.

- 1977 *Etruscologia* (6. edition. Milan).

Patterson, A.

- 1972 "Spinning and weaving", *A History of Technology* II (Oxford), pp. 191-220.

Poggiani Keller, R. – A. Fossati

- 1995 "Parco delle Incisioni Rupestri di Grosio (Sondria)", *Italia padana e centro-alpina* (Preistoria e Protostoria in Italia. Guide archeologiche 5. Forli), pp. 235-241.

Price, J.

- 1976 "Glass", *Roman Crafts* (ed. by D. Strong & D. Brown. Duckworth), pp. 111-125.

Prohászka, M.

- 1995 *Reflections from the Dead. The Metal Finds from the Pantanello Necropolis at Metaponto. A Comprehensive Study of Grave Goods from the 5th to the 3rd Centuries B.C.* (Studies in Mediterranean Archaeology CX). Jonsered.

von Rede, S.

- 1994-1995 "Archäologie und Politik: Die Geburt der Pallottino These", *Talanta. Proceedings of the Dutch Archaeological and Historical Society* 26-27, pp. 49-57

Richter, G. M. A.

- 1974 *A Handbook of Greek Art* (7. edition. Vienna).

Rosenberg, A.

- 1930 *Der Mythos des 20. Jahrhunderts* (Berlin).

- Salo, U.
 1989 "Astian kulttuurihistoriaa Suomessa ja naapurialueilla", *Suomen Museo* 96, pp. 5-48.
 1968 *Die frühromische Zeit in Finnland* (Suomen muinaismuistoyhdistyksen aikakauskirja 67. Helsinki).
- Sammallahti, L.
 1980 *Suomalainen kansanomainen jalaskehto* (Kansatieteellinen arkisto 31). Helsinki.
- Schwantes, G.
 1952 *Deutschlands Urgeschichte* (7th edition. Stuttgart).
- Sinnemäki, M., ed. by
 1953 1982 *Lentävien laudeiden sanakirja*. Suomen kielen sanakirjat 5. Keuruu.
- Soprintendenza archeologica di Roma
 1954 1978 *I galli e l'Italia*. Rome 1978.
- Stead, I. M.
 1994 "Lindowin mies: Ihmisuhri 2 000 vuoden takaa", *Etruskeista viikinkeihin* (Ihmisen suku 3. Honkong), p. 196.
- Toivonen, Y. H.
 1974 *Suomen kielen etymologinen sanakirja I* (2nd edition. Helsinki).
- Stoklund, B.
 1990 "Ethnological Interpretations of Implements. The Hayrake as an Example", *Ethnologia Europaea* 20, pp. 5-14.
- Tsetkhladze, G. R.
 1995 "Did the Greeks go to Colchis for Metals?", *Oxford Journal of Archaeology* 14, pp. 307-331.
- Vilkuna, K.
 1934 "Zur Geschichte der finnischen Sichel", *Suomen muinaismuistoyhdistyksen aikakauskirja* 40, pp. 223-235.
 1935 1935 *Varsinaissuomalaisten kansanomaisesta taloudesta*. Kansatieteellinen tutkimus (Porvoo).
 1936 1976 "Sirpit", *Suomen kansankulttuurin kartasto 1. Aineellinen kulttuuri* (ed. by T. Vuorela. Helsinki), p. 42.
 1978 *Isien työ. Veden ja maan viljaa, arkityön kauneutta* (5th edition. Keuruu).
- Waldbaum, J. C.
 1983 *Metalwork from Sardis: the Finds through 1974* (Archaeological Exploration of Sardis 8. Cambridge, Mass. - London).
- White, K. D.
 1967 *Agricultural Implements of the Roman World* (Cambridge)
 1986 *Greek and Roman Technology* (London).

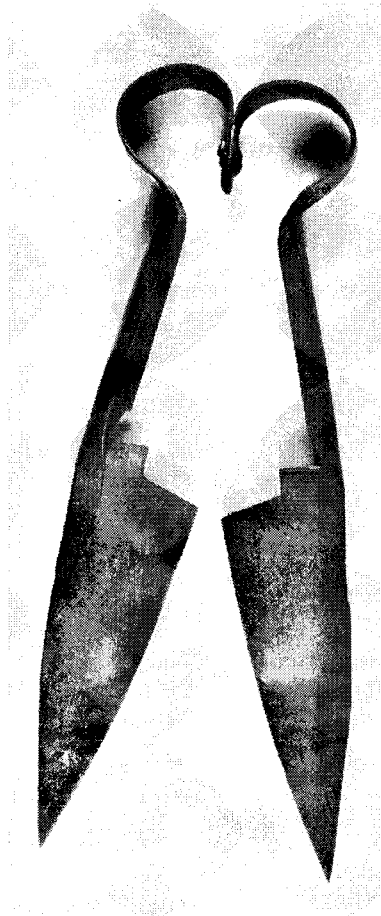


Figure 1.

“Grandmother’s shears” in their traditional task. A photo in T. Vuorela, *Suomalainen kansankulttuuri* (3rd edition, Porvoo-Helsinki-Juva 1983), p. 473.

THE INDO-EUROPEANS



Professor Jean Haudry

of the University of Lyons, France, surveys our contemporary knowledge about the Indo-Europeans: Who they were, where they lived, their language, archaeology, appearance, character and mentality. He examines their political institutions, family life and social system, legal heritage and religious beliefs.

This book includes a useful synopsis of common Indo-European words in various languages, an extensive bibliography and an invaluable index of sources for those who wish to learn more about the Indo-Europeans as a people.

Softback. 166 pages.

ISBN 1-878465-28-7. - \$20.00 plus Postage \$3.50 (USA) \$5.50 (foreign)

Scott-Townsend Publishers

**Tel (202) 371 2700, or soccon@aol.com with MC / Visa or send
US Cheque or Money Order to P.O. Box 34070, N.W., Washington, D.C. 20043**

Sexual Maturation In Well-Off Chandigarh Boys: A Longitudinal Study

A. K. Bhalla¹

*Postgraduate Institute of Medical Education
and Research (PGIMER), Chandigarh*

The pattern of sexual maturation among 134 adolescent boys representing well-off socio-economic strata of Chandigarh, India, was studied as per Tanner's (1962) method following a mixed longitudinal research design. An early sign of onset of puberty in boys was the development of genitalia (i.e., stage G-II) at a mean age of 11.5 years. This was followed by the appearance of axillary (13.4 years) and pubic hair (13.5 years). Facial hair (14.0 years) was the last to appear. The change of voice occurred at a mean age of 15.5 years. Age of initiation of genitalia development (i.e., stage G-II) in the development of Chandigarh boys was found to be generally similar to that of boys of American and British origin, but slower than that of many other Indian communities. With regard to the completion of genitalia development (i.e., Stage G-V), when compared to adolescents of both Western and Indian origin, Chandigarh boys demonstrated a substantial differences in age-related development, which may be due to genetic (racial /ethnic) and/or cultural differences.

Key Words: Sexual maturation; Pediatrics; India; Socio-cultural strata; Diversity of genetic origins; Environmental conditions; Axillary and facial hair; Genitalia; Change of voice.

The process of reproductive maturity in boys is marked by the appearance of different stages of genitalia development, growth of pubic, axillary, facial hair and change of voice. In contrast to studies about the developed western world (Eveleth & Tanner 1990, Marshall & Tanner 1986), the number of studies on sexual maturation of Indian boys is meager. However, some attempts made by earlier authors (Prabhakar et al 1972, Bhargava et al 1979, Agarwal et al 1974, Kishore et al 1978, Kaul et al 1980, 1983, Singh & Sidhu 1981, Singh 1992, Agarwal et al 1992) to study the pattern of sexual maturity among Indian boys are noteworthy. But the majority of these studies were carried

¹ Address for correspondence: Dr. A.K. Bhalla, Additional Professor, Department of Pediatrics, Advanced Pediatric Centre, Postgraduate Institute of Medical Education, and Research (PGIMER), Chandigarh (INDIA) - 160012, email: anilbhalla@sify.com

out on ethnically heterogeneous group of subjects, and the values presented on children pertain to pooled yearly ages (i.e., age groups). In some instances (Kaul et al 1980), cross-sectional data were treated as if these were longitudinal in nature to calculate the rate of change (velocity) of testicular volume in boys.

Attainment of different pubertal signs among boys from higher socio-economic strata was recorded to be earlier than their counterparts from lower socio-economic strata. In a country like India that has great ethnic, environmental and socio-economic diversity, data generated on adolescents representing one region should not be used to evaluate pubertal attainments of children belonging to another region of country. Hence, there is a need to establish base-line data for different indicators of sexual maturity of adolescents representing this part of India. Also in view of the complete absence of reliable information on the different measures of sexual maturity of boys residing in the Union territory of Chandigarh, in the present study an attempt has been made to generate suitable sets of data for different indicators of sexual maturity of boys from well-off socio-economic strata of Chandigarh.

Material and Methods:

A total of 318 examinations carried out on 134 normal, healthy boys between 9-17 years of age born to parents living in The Union Territory of Chandigarh (Northwestern, India) comprised the sample for this mixed longitudinal study. These boys were enrolled from the Growth Clinic of Advanced Pediatric Centre, Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh and represented the well-off (upper) socio-economic strata of Chandigarh (U.T.). Children suffering from any bodily deformity, endocrine disorders, developmental delay, growth/nutritional deficit or chronic disease, particularly related to the central nervous system, were not included in this study. The biological age of every subject was determined on the basis of the known date of birth and in some doubtful cases it was verified from birth/school records.

Every child included in the study was examined for different stages of genitalia development as per the method suggested by Tanner(1962) . However, with regard to hair development and

change of voice, the mere presence or absence was recorded. All examinations of boys up to 13.0 years of age were made at six monthly age intervals with a time tolerance of ± 15 days in the Growth Clinic/Lab of the Department of Pediatrics. Thereafter, these boys were examined at yearly intervals. Boys who could not visit the Clinic at a pre-appointed date and time were followed up at their homes. Age-wise, the distribution of boys who could be examined during different follow-ups using mixed-longitudinal research design is shown in Table (1).

Mean and SD were calculated for age of attainment of each of the different stages of genitalia development, initiation of the development of different hair types, as well as change of voice.

Observations and Results

The mean $\pm$ SD (yr) age of attainment of different stages of genitalia development [i.e., stage G-II (11.5 ± 2.54 yr), G-III (13.01 ± 2.07 yr), G-IV (14.87 ± 2.54 yr), G-V (15.25 ± 1.95 yr)] in well-off Chandigarh boys are shown in Table 2. Of the three types of hair, axillary hair developed at mean age of 13.4 ± 2.03 yr, and pubic hair by 13.5 ± 1.96 years of age. Facial hair was last to erupt, doing so by the age of 14.05 ± 2.14 years. The average age recorded for change of voice in boys was 15.54 ± 1.25 yrs.

Discussion

An early sign of the onset of puberty in well-off Chandigarh boys was development of genitalia (i.e., stage G-II) by the mean age of 11.5 years, which was followed by the development of axillary and pubic hair showing close proximity with each other (i.e., at 13.4 and 13.5 years, respectively). Facial hair was last to erupt in Chandigarh boys, doing so by the mean age of 14.0 years (Table-2).

The genitalia development stage G-II in well-off Chandigarh boys was attained at the mean age of 11.5 years, which was later by about about .2 years of the same stage noticed in affluent Indian boys (11.3 years) studied by Agarwal et al (1992) and a year later than Gaddi boys (10.58 yr.) by Singh and Sidhu (1981). A delay of about 0.8 year was recorded in the initiation of enlargement of genitalia among Chandigarh boys when compared with upper-class boys studied by Bhargava et al (1979) in Delhi. However, Dutch boys studied by Roede and Van-Wieringen (1985) attained G-II stage slightly earlier (i.e., at the median age of 11.33 years) than the normal Chandigarh boys.

On the contrary, Chandigarh boys showed close similarity with American (Reynolds and Wines 1951) and British (Marshall and Tanner 1970) boys who attained G-II stage at 11.5 and 11.6 years, respectively.

From the above account it clearly emerges that as far as initiation of genitalia development (G-II stage) is concerned Chandigarh boys show close similarity to their American and British counterparts, but they remain at variance with their other Indian counterparts. This speaks of the existence of ethnic differences among boys inhabiting different regions of India. Commenting upon the age-related variation noticed in the development of genitalia in boys representing Western populations, Marshall and Tanner (1986) have mentioned that the boys they studied may attain stage G-II at any time after their ninth birthday, but sometimes do not to do so before they reach the age of 14. Thus a 14-year-old, or occasionally even a 15-year-old boy whose genitalia remains infantile may not be abnormal.

The completion of the maturity of genitalia (i.e., stage G-V) in well-off Chandigarh boys was noticed at the mean age of 15.25 ± 1.95 years (Table-2). This is almost similar to that encountered among Dutch boys (Roede and Van-Wieringen 1985), but is earlier than the attainment of the same stage in boys of American (Reynolds & Wines 1951), Gaddi (Singh & Sidhu 1981) and Indian origin (Agarwal et al 1992) in different parts of the country. On the contrary, the attainment of the G-V stage in Chandigarh boys was found to be delayed relative to their Punjabi (Singh et al 1992) and British (Marshall and Tanner 1970) counterparts by a period of more than 6 and 3 months, respectively. It appears from the above account that the completion of genitalia maturity noticed among boys representing different population stocks has shown an age-related variation. On observing a similar situation earlier, Marshall and Tanner (1986) commented that complete maturity of genitalia (i.e., Stage G-V) may be reached before the 13th birthday, but some boys are not fully developed until they are 18 years of age and are occasionally even older.

Irrespective of the great variation in age of attainment of G-II and G-V stages among representatives of different Indian and Western populations, the time interval taken by well-off Chandigarh boys to move from stage G-II to G-V was found to be less (3.75 years) than that recorded among boys of Gaddi (4.89

The Mankind Quarterly

years), Dutch (4.00 years) and American (5.8 years) origin. However, boys of British origin took only 3.30 years for the completion of their genitalia development and thus depicted an advancement of about 0.45 years over Chandigarh boys. (Table 3)

Hair Development

With regard to the development of hair, the mere presence or absence was recorded in the present study. Thus, of the five stages described in respect of hair development, only stage-II was taken into consideration as per the criterion laid down by Tanner (1962). The assessment of stage II was based on the distribution of hair in the respective regions of the body rather than on its density.

The appearance of pubic hair (Stage PH 2) in well-off Chandigarh boys was noticed at a mean age of 13.5 ± 1.96 years (Table-2). It was reached on the average at 11.8 years in Dutch (Van-Wieringen et al 1971), at 12.2 years in Swiss (Largo and Prader 1983), at 12.5 years in Swedish (Taranger et al 1976), at 11.8 years in well-off Turkish (Neyzi et al 1975) and at 12.2 years in American (Reynolds and Wines 1951) boys. The delayed appearance of the pubic hair noticed in well-off Chandigarh boys in comparison with their western counterparts appears to be racial in origin. Twin boys in Chandigarh studied earlier by Sharma (1983) had also shown an equally late age at PH-2 (Marshall and Tanner 1986). On the contrary, Chandigarh boys having attained stage PH-2 at 13.5 years showed close similarity with Gaddi boys (Singh and Sidhu 1981) growing up in the Himalayas at an altitude of 2000-3000 m. However, it was found to be earlier by about 0.7 years in Chandigarh boys than their affluent other Indian counterparts studied by Agarwal et al (1992).

Axillary and Facial Hair

The first appearance of axillary hair among Chandigarh boys was recorded at 13.40 ± 2.03 years (Table - 2), which was earlier by 1.5 years than the affluent Indian boys (14.9 yr.) studied by Agarwal et al (1992). However, it was found to be quite close to boys of Turkish (Neyzi et al 1975) origin in whom these appeared at an average age of 13.5 years, which was about 1.3 years later than the onset of growth of pubic hair. In Swedish boys this interval was 1.5 years (Taranger et al 1976). In general,

axillary hair is seen 1 or 2 years after the first pubic hair is developed. However, this interval varies greatly from one child to another. Occasionally, the axillary hair may appear before the pubic hair (Marshall and Tanner 1986). This is a case similar to what had happened in Chandigarh children, in whom these appeared slightly (i.e., only by 0.1 year) earlier than the pubic hair.

The first appearance of facial hair in well-off Chandigarh boys was recorded at a mean age of 14.05 ± 2.14 years (Table – 2). This was about 0.75 years earlier than the other Indian boys examined by Agarwal et al (1992) and also by 0.5 years than the Turkish boys (Neyzi et al 1975), in whom facial hair appeared later by about 1 year than the development of axillary hair, which erupted at the age of 13.5 years (Marshall and Tanner 1986). Mean age of appearance of facial hair among upper-class Delhi boys was noticed to be 13.6 ± 2.1 years by Bhargava et al (1979), revealing a delay of about 0.4 of a year in our subjects.

Like the variable age-related inter-relationship recorded between the development of axillary and pubic hair, the relationship between facial and axillary hair in boys was also found to be of the same nature. However, as an exception, a simultaneous appearance of hair at the two sites has also been reported in literature (Marshall and Tanner 1986).

Change of Voice

The age at which the voices of the boys in our sample began to break was found to be 15.54 ± 1.55 years (Table – 2), which represented a delay of about 0.6 years in contrast to their Swedish (Taranger et al 1976) counterparts.

Conclusion

The data presented here was computed recently from normal, healthy subjects for the purpose of detecting problems relating to the attainment of sexual maturity among Indian boys inhabiting the northwestern region of the country. While we have cited comparative figures from just one or to other studies, we offer this data as an aid to those who would make more extensive, age-related cross-cultural comparisons with boys of diverse genetic origin attaining maturity in a wide variety of different socio-cultural and environmental conditions around the world.

Table 1*Age Wise Distribution of Boys Examined During Different Follow-Ups*

Age (+ yr.)	No. of boys examined
9.0	35
9.5	35
10.0	26
10.5	31
11.0	38
11.5	25
12.0	23
12.5	21
13.0	38
14.0	20
15.0	11
16.0	7
17.0	8
No. of total	318
	Examinations

Table 2*Mean, SD (yr.) of Genitalia, Hair Development and Voice Change in Well-off Chandigarh Boys*

<i>Genitalia Development</i>	<i>Mean</i>	<i>S.D</i>
G-II	11.50	2.54
G-III	13.01	2.07
G-IV	14.87	2.54
G-V	15.25	1.95
<i>Hair Development</i>		
Pubic	13.50	1.96
Axillary	13.40	2.03
Facial	14.05	2.14
Voice-Change	15.54	1.25

Table 3

*Median Age (yr.) of Attainment of Various Stages of Genitalia
Development in boys belonging to Different Male Populations*

<i>Pubertal Characters</i>	<i>Gaddi (Singh & Sidhu, 81)</i>	<i>Punjabi (Singh, 92)</i>	<i>British (Marshall & Tanner, 70)</i>	<i>Dutch (Roede & Van Wieringen, 85)</i>	<i>American (Reynolds & Wines, et al, 92)</i>	<i>Indian (Agarwal, 92)</i>	<i>Present study*</i>
<i>Genitalia</i>							
G2	10.58	-	11.60	11.33	11.50	11.30	11.50
G3	13.14	12.14	12.90	13.06	12.70	12.80	13.01
G4	14.53	13.99	13.80	13.98	13.40	14.10	14.87
G5	15.47	14.72	14.90	15.33	17.30	16.40	15.25
<i>Interval in Developmental Stages (yr.)</i>							
G2-G5	4.89	-	3.30	4.00	5.80	5.10	3.75

* mean age

Acknowledgement

A generous financial support extended by the Department of Science and Technology, Chandigarh Administration, Chandigarh (UT) to carry out this study is thankfully acknowledged.

References

- Agarwal, D.K., Agarwal, K.N., Upadhyay, S.K., Mittal, R., Prakash, R. & Rai, S.
1992 Physical and sexual growth pattern of affluent Indian children from 5 to 18 years of age. *Indian Pediatrics* 29:1203-1282.
- Agarwal, K.N., Sen, S., Tripathi, A.H. & Katiyar, G.P.
1974 Physical Growth characteristics in relation to sexual growth. *Indian Pediatrics*, 11:99.
- Anthony, N.J. & Robert, M.M.,
Growth, fatness and leanness in Mexican American children. *American Journal of Clinical Nutrition* 33:2009-2020.

The Mankind Quarterly

- Bhargava, S.K., Duggal, S., Ramanujacharyulu, T.K.T.S. & Chaudhary, P.
1979 Pattern of pubertal changes and their interrelationship in boys. *Indian Pediatrics* 16:849-894.
- Eveleth, P.B. & Tanner, J.M.,
1990 *Worldwide variation in human growth*. Cambridge : Cambridge University Press.
- Kaul, K.K., Rajput, V.J., Pandi, R.V., Puri, V.S & Khurana O.
1980 Growth of testicular size in upper class adolescent boys. *Indian Journal of Medical Research* 72: 132-136.
- Kaul, K.K., Mukerji, B., Sundran, K.R. & Goel, R.K.
1983 Growth at adolescence II – a study of the development of secondary sex characters in urban boys. *Indian Pediatrics* 20:249.
- Kishore, N., Mathur, Y.C., Qureshi, S. & Pershad, B.
1978 Study of physical and sexual growth of pre-adolescent and adolescent children of rural Hyderabad and their knowledge ,attitude towards human reproduction and Family planning. *Indian Pediatrics* 15: 147-154.
- Largo, R.H. & Prader, A.
1983 Pubertal development in Swiss boys. *Helvetica Paediatrica Acta* 38:211-228.
- Marshall, W.A. & Tanner, J.M.
1970 Variations in the pattern of pubertal changes in boys. *Archives of Disease in Childhood* 45:13.
- Marshall, W.A. & Tanner, J.M.
1986 Puberty In : *Human Growth – a comprehensive treatise* (eds) F. Falkner & J.M. Tanner. New York : Plenum Press.
- Neyzi, O., Alp, H & Oshon, A.
1975 Sexual maturity in Turkish boys. *Annals of Human Biology* 2:251-259.
- Prabhakar, A.K., Sundran, K.R., Ramanujacharyulu, T.K.T.S & Taskar, A.D..
1972 Influence of socio-economic factors on the age at appearance of different puberty signs. *Indian Journal of Medical Research* 60:789-792.
- Reynolds, E.L & Wines, J.V.
1951 Physical changes associated with adolescence in boys. *American Journal of Diseases in Children* 529-547.
- Roede, J & Van-Wieringen, J.C
1985 Growth diagrams 1980, Netherlands third nation-wide survey (supplement) Jaargang 63, Paginas : 1
- Singh, S.P. & Sidhu, L.S.
1981 Pubertal development of Gaddi Rajput boys of Dhula Dhar range of the *Himalayas Zoology Morphology Anthropology* 72:89.
- Singh, S.P. Sidhu, L.S. & Singh, J.
1992 *Skeleton Maturity: Growth, Development and Physical Performance*. Patiala: Human Biology Publication Society.
- Sharma, J.C.
The genetic contribution to pubertal growth and development studied by longitudinal growth data on twins. *Annals of Human Biology*, 10:163-172.
- Tanner J.M.
Growth at Adolescence, (2nd ed.) Oxford: Blackwell Scientific Publications.

Taranger, J., Lichtenstein, H & Svenberg-Redegren, I.

The somatic development of children in a swedish urban community: VI. Somatic Pubertal development, *Acta Paediatrica Scandinavica* (Suppl) 258:121-135.

Van-Wieringen, J.G., Wafelbakker, F., Verbrugge, H.P. & Hass, J.H de.

1971 *Growth Diagrams 1965 Netherlands: Second National Survey on 0-24 year olds*, Groningen, Netherlands: Wolferters – Noordhoff.

IQ Population Genetics: It's not as Simple as You Think

Gerhard Meisenberg¹
Ross University, Dominica

The question of cognitive differences between human populations is one of the most contentious issues in the study of human diversity. After reviewing the worldwide patterns of cognitive test performance, this article evaluates alternative causal hypotheses and evolutionary mechanisms. Racial affiliation and latitude correlate with IQ test performance, as does economic development. Religion, a history of colonialism, and a history of Communist rule are important in some cases. This article proposes mechanisms of gene-culture co-evolution that can explain the worldwide patterns. The genetic component of these mechanisms is likely to become testable with further advances in molecular genetics.

Key Words: Evolution; Intelligence; Population genetics; Brain size; Race differences; Natural selection; Polymorphism; Mutational load; Gene-culture coevolution.

Population genetics is the study of genetic variation in human populations, and IQ population genetics is the population-level study of those genetic variations that influence mental ability. Admittedly, this field does not yet exist as an area of established scientific inquiry because hardly any of the genetic variations that influence human cognition in the non-pathological range are known at the present time. However, the first reports about intelligence-related genetic traits have appeared in the literature (Egan *et al.*, 2001, 2003), and more information is likely to become available in the not too distant future.

At this point in time we can only chart the worldwide variations in people's performance on standardized cognitive tests, and evaluate the plausibility of causal hypotheses. In this article I review the available evidence, not to advance one or another explanation but to provide a road map for future studies that will increasingly rely on the methods of molecular genetics.

¹ Address for correspondence: Department of Biochemistry, Ross University Medical School, Picard Estate, Dominica, (Eastern Caribbean):
Gmeisenberg@rossmed.edu.dm

The Nature of Human Genetic Diversity

When the genomes of two unrelated people are compared, about one in every 1200 nucleotides in their DNA is different: 2.5 million differences altogether. A disproportionate amount of this variation is in non-coding “junk DNA” and is presumably irrelevant for any phenotypic trait (Venter *et al.*, 2001). This level of genetic diversity is low when compared with other animal species. The only sensible explanation is that modern humans evolved from a relatively small population only recently. Over time, all small populations tend toward homogeneity because many of the less common genetic variants get lost by natural selection or by chance.

Reconstructions of the history of mitochondrial DNA (Ingman *et al.*, 2000), the Y chromosome (Underhill *et al.*, 2001) and autosomal nuclear DNA (Marth *et al.*, 2003) all converge on the conclusion that our ancestors emerged from a moderately severe population bottleneck sometime between 50,000 and 150,000 years ago, at roughly the time when physically modern *Homo sapiens* began spreading over the world.

Both genetic evidence (Ingman *et al.*, 2000; Underhill *et al.*, 2001; Zhivotovsky *et al.*, 2003) and the fossil record (White *et al.*, 2003) point to Africa as the likely homeland of our species. According to the most widely accepted scenario, one or more subgroups of early modern humans left Africa between 120,000 and 100,000 years ago to become the ancestors of the non-African populations.

This implies that most of the “racial” variation we see today evolved in this short time period. For example, population-level differences in climate-selected traits such as skin color can have evolved only after the spread of modern humans out of the tropical and subtropical regions of Africa and South Asia. Cavalli-Sforza, L.L., Menozzi, P and Piazza, A. (1994) *The History and Geography of Human Genes.*, Princeton, NJ: Princeton University Press (p. 156) state that *Homo Sapiens* migrated into the Near East about 100,000 bp. and were in China by 60,000 bp.

A similar time scale applies to the evolution of possible cognitive differences between human populations.

The Nature of Human Intelligence

Reasoning ability, also known as “fluid” intelligence, is the

The Mankind Quarterly

ability to process the information that is held in short-term memory stores. This thinking system of the brain is called working memory (Engle *et al.*, 1999; Kyllonen, 1996).

Some brain areas that are involved in working memory are active in most or all reasoning tasks and are related to "general" intelligence, while others are recruited only for tasks that require specific abilities such as memory span, verbal ability, or visuo-spatial abilities (Fuster, 2003, pp. 213-247). Thus we must expect that some genes influence general reasoning ability while others affect more specific abilities, depending on the brain circuits on which they act.

Actually, "general" intelligence is more heritable than specific abilities. In modern societies between 50% and 80% of the variation in overall IQ test performance among adults (and less than this in children), but only a small fraction of the variability in specific intellectual abilities, is attributed to genes (Bouchard, 1998; Plomin and Spinath, 2002).

The concept of heritability is based on a comparison between the relative strength of genetic and environmental influences at the population level. Therefore we must expect that in an egalitarian society, where everyone has the same opportunity to develop his "native" intelligence, IQ heritability is high, that is to say, IQ is more directly influenced by genetic factors; and in a society where some can develop their abilities while others are held back by an unfavorable environment, IQ heritability is low and environment plays an important role.

In our world at the beginning of the 21st century, differences in wealth, standard of living and educational opportunities are far greater between nations than they are among individuals within the same country (Goesling, 2001). This makes it likely (but not certain) that environmental factors may be proportionately more important for observed differences in mental ability between nations than they are for differences among individuals in the same country.

Mutational Load and Common Polymorphisms

Mental abilities can, in theory, be influenced by common genetic polymorphisms. In this case we have at least two variants, or alleles, of a gene, one favoring higher and the other favoring lower intelligence. The alternative alleles can persist side by side in the population only if neither of them is too destructive, so

that both are transmitted with nearly the same efficiency.

Therefore the phenotypic effects of common polymorphisms are always subtle, and it is unlikely that any one of them would make a difference of more than a few IQ points. The polymorphisms described by Egan *et al.* (2001, 2003) appear to be of this kind. Now think of, say, one hundred polymorphic genes like this, each adding or subtracting one or two or even 4 or 5 IQ points. Your intelligence would, roughly, depend on the overall balance between high-IQ variants and low-IQ variants. However, it has been argued that alleles are mainly additive, in which case, two high IQ alleles could be twice as effective as one, and four times more effective than a single low IQ allele.

Genes, like drugs, have many side effects. This is called pleiotropy. For example, the average IQ of nearsighted people is 6 to 8 points higher than the average for normal-sighted people. According to one proposal this association is caused by an as yet unidentified gene that raises intelligence but also causes nearsightedness. Presumably this genetic variant is common in populations that have been selected for high intelligence in recent millennia, and rare in those that have been selected for good eyesight (Cohn *et al.*, 1988).

Variations in mental ability can also be caused by IQ-lowering mutations that pop up randomly. Every child is born with an estimated 100 to 300 new mutations on top of those inherited from the parents. Most new mutations are innocuous, but about 1 to 3 of them are slightly deleterious (Nachman and Crowell, 2000; Crow, 2000). For example, there is evidence that schizophrenia is in large part caused by deleterious mutations (Byrne *et al.*, 2003).

We must expect that a significant fraction of the slightly deleterious mutations impair mental ability to some extent. These mutations are genetic garbage that has to be removed by natural selection. In other words, if you have only a few IQ-lowering mutations you are bright, and if you have many of them you are stupid.

Most IQ-lowering mutations are expected to be pleiotropic, doing other nasty things in addition to their impairment of thinking ability. As a result they tend to get selected out of the gene pool on a time scale of 10 to 200 generations, depending on their dominant or recessive mode of expression and the

severity of the damage they cause.

Mutational load is considered important by most experts in the field. Most IQ-gene hunters who are looking for genetic polymorphisms compare the genes of high-IQ groups with those of average-IQ groups, the assumption being that below-average intelligence is mainly caused by mutational load rather than common polymorphisms (Plomin and Craig, 2001).

Since mildly detrimental mutations with pleiotropic effects are continuously removed from the gene pool, they cannot be responsible for early-evolved genetic differences between human populations. However, selection effects on common polymorphisms that took place tens of thousands of years ago might still be traceable in modern human populations.

Drifting Genes

It has been claimed by C. Loring Brace, that high intelligence has been *equally* favored by natural selection in *all* human populations, and that therefore genotypic intelligence must be the same everywhere. According to Loring Brace, "Human cognitive capacity, founded on the ability to learn a language, is of equal survival value to all human groups, and consequently there is no valid reason to expect that there should be average differences in intellectual ability among living human populations" (Brace, 1999, p. 245).

That is not a universally-accepted opinion, and his premise that high intelligence is always favorable predicts that new mutations that raise intelligence will tend to spread in the population wherever they occur. But high intelligence is not always favored by natural selection. In modern societies, in particular, the unintelligent usually have more children than the bright. In the late 20th century United States, unequal reproductive rates favoring the less intelligent would have *lowered* the IQ of the population by anywhere between 0.35 and 0.8 points per generation had the environment remained unchanged over time (Loehlin, 1997; Retherford and Sewell, 1988; Vining, 1995; Lynn, 1996 – *Dysgenics, Praeger*). Modern societies are aberrant cases, but even under more pristine conditions, it is hard to see how high intelligence could have been *equally* favored in all populations.

Also the argument that the 100,000 years or so since the dispersal out of Africa were insufficient for the evolution of

genetic differences is invalid. To create an IQ difference of, say, 15 points between two populations in 100,000 years, natural selection would have to drive their IQs apart by only 0.004 points every generation – about 1% of the selective pressure in late 20th-century America.

According to the population geneticist Luigi Luca Cavalli-Sforza and his associates, 84.4% of our DNA diversity is accounted for by differences between individuals. 10.8% are “racial” differences between continental populations, and the remaining 4.7% are “ethnic” differences between populations on the same continent. Through gene flow by interbreeding and short-range migration, neighboring populations are always more similar to one another than geographically distant ones (Barbujani *et al.*, 1997). Most of the DNA variation used in these studies is in non-coding junk DNA and is presumably not subject to natural selection.

Findings like this, showing the small contribution of between-population differences to overall genetic diversity, spawned the widespread belief that between-population differences in mental abilities and other psychological traits must be minimal as well.

That this conclusion is premature has been demonstrated by Jensen. When Jensen analyzed IQ variation in a group of 622 black and 622 white children in California, he found that 44% of the variation was within families, 29% between families within socioeconomic and racial groups, 8% between socioeconomic groups, and only 14% between races. The rest was measurement error. In this study the two races differed by 12 IQ points (Jensen, 1980, p. 43).

Jensen’s value of 14% for the influence of race is close to the value for racial + ethnic variation in Cavalli-Sforza’s calculation. If IQ genes float as randomly in the gene pool as Cavalli-Sforza’s DNA variations, then the difference in “genotypic” intelligence between the most divergent human populations should be about as great as the measured difference between black and white children in California: about 12 IQ points. We can further predict that there is no conspicuous geographic patterning, only that neighboring populations usually are more similar than distant ones.

The Power of Natural Selection

In reality, the genes that shape our thinking ability are not likely to float randomly in the gene pool. Being bright or stupid can make a difference for survival and reproduction, and therefore these genes are almost certainly subject to natural selection. If they are subject to natural selection, the correspondence between Jensen's and Cavalli-Sforza's results is fortuitous.

The difference between selected traits and randomly drifting traits is illustrated by skin color and skull shape. 81% of the craniometric variation in our species is between individuals, 6% among local populations, and 13% among the major races. These values are similar to the variation in (presumably) non-selected DNA diversity.

By contrast, only 9% of skin color variation is between individuals living in the same area, 3% is among local populations within regions, and 88% is "racial" variation between regions (Relethford, 2002). The important difference is that skull shape has not been subject to divergent selection in different parts of the world while skin color evolved according to the needs for UV protection and vitamin D synthesis (Barsh, 2003).

If intelligence is subject to diversifying selection the way skin color is, we must expect large differences in "genotypic" intelligence between the more divergent human populations, rather than the modest differences predicted by random genetic drift.

Intelligence in Space and Time

Thanks to the detective work of the British scholar Richard Lynn, the geography of intelligence in the modern world is known in some detail. In a recent monograph, Lynn and Vanhanen provide data for average national IQ and per capita gross domestic product (adjusted for purchasing power) for 81 nations (Lynn and Vanhanen, 2002).

Table 1 summarizes some of their results. Out of Lynn and Vanhanen's sample of 81 nations, it includes only those that can reasonably be assigned to one of the three major racial groups: Negroid, Mongoloid, or Caucasoid. Also excluded are countries such as Australia where racial affiliation is unambiguous and reasonably homogeneous, but the population has been

displaced to a different climate zone. However, displaced populations that did not switch climate zones, such as New Zealanders and Afro-Caribbeans, are included. In some cases Lynn and Vanhanen's data have been disaggregated to the sub-national level (Germany, Singapore, South Africa), and the data on Brazilians have been added from Fernandez, 2001. Table 1 includes information about latitude, predominant religion, a history of colonial rule, and a history of Communist rule in addition to Lynn and Vanhanen's data on IQ and GDP.

The range of variation in national IQ is impressive. However, the measured intelligence of human populations is not constant over time. This time dimension has been brought to wider attention during the 1980s by James Flynn and, independently, Richard Lynn (Flynn, 1984, 1987; Lynn and Hampson, 1986).

Broadly, the average population IQ in the countries Flynn studied has risen by about 18 IQ points during the 20th century. 50 years ago Europeans and Americans were about as test-bright as Egyptians and Iranians are today. The average present-day American scores at the 84th percentile of Americans 50 years ago. This powerful secular trend, known as the "Flynn effect", can only be due to environmental improvements.

Surprisingly the greatest gains are seen on "culture-reduced" tests of pure reasoning ability, and the smallest on tests of school-related knowledge and skills such as vocabulary and mental arithmetic (Flynn, 1987). Although we know that schooling raises the IQ (Ceci, 1991), secular IQ gains seem unrelated to better schooling. They may be caused by better nutrition (Lynn, 1990). We also know that brain size has increased over time (A.K.H. Miller and Corsellis, 1977), and perhaps one reason why we can think better than our great-grandparents is that we have slightly bigger brains.

Thus we know beyond a reasonable doubt that purely environmental effects can have a massive impact on the average intelligence level of the population.

Correlation with Race

Some scholars, most notably Richard Lynn and Philippe Rushton, propose climate and ecology as selective forces. According to Lynn, the dependence on big-game hunting in northern climates necessitated complex social organization with efficient cooperation and intelligent planning, while tropical

populations could always fall back on cognitively undemanding food gathering (Lynn, 1991).

Rushton emphasizes the need for close family ties and high parental investment in harsh climates. While most childhood mortality in the tropics was caused by uncontrollable endemic diseases, most childhood mortality in the arctic was due to the predictable challenges of seasonal food shortages and the rigors of the climate. These challenges demanded intelligent planning in addition to stable families (Rushton, 1995).

These theories postulate that physical and cognitive race differences evolved at roughly the same time, starting about 100,000 years ago when modern humans first ventured out of the tropics and into the inhospitable wastelands of central and northern Asia. Thus both Lynn and Rushton predict that intelligence genes cluster with climate-selected physical traits such as skin color. Both make the specific prediction that intelligence is highest in Mongoloids, lowest in Negroids, and intermediate in Caucasoids.

This prediction is borne out by the data in Table 1. The average IQ is 97.1 for Mongoloids, 93.9 for Caucasoids, and 69.6 for Negroids. IQ also correlates with latitude (Pearson's $r = 0.7559$) and per-capita GDP ($r = 0.7348$). However, in multiple regression models with either latitude or GDP or both as co-predictors of IQ, race remains a statistically significant predictor at the $P < 0.0001$ level. The inclusion of latitude and GDP as predictors increases the IQ gap between Caucasoids and Mongoloids while diminishing the gap between Caucasoids and Negroids. These analyses, and those reported in the following paragraphs, were performed on the data in Table 1 using JMP statistics software.

Thus at least part of the relationship between race and IQ is mediated neither by the latitude at which the populations are living nor by their wealth. This tends to support the theories of Lynn and Rushton about climate-driven selection going back to the Ice Age. At the molecular level, this "early" genetic selection predicts systematic differences between the major racial groups in IQ-modifying polymorphisms, but not in pleiotropic low-frequency mutations with larger effects.

This implies that the proportion of the *genetic* variance for intelligence that is due to common polymorphisms as opposed to mutational load is likely to be greater in well-mixed hybrid

populations such as Mexicans and mixed-race Brazilians than it is in more homogeneous populations such as the Icelanders and Finns. IQ geneticists in search of common polymorphisms are well advised to recruit their average-IQ and high-IQ subjects from admixed populations rather than the more homogeneous populations that are otherwise preferred by gene hunters.

Another implication is that many "IQ genes" are likely to be found next to "ethnic markers". Ethnic markers are DNA polymorphisms that occur at substantially different frequencies in different populations. They are selectively neutral, but are presumably placed next to locally selected genes in the genome (Kayser *et al.*, 2003).

The relationship between race and IQ presents us with a puzzle. Lynn and Vanhanen have shown conclusively that IQ predicts economic development (Lynn and Vanhanen, 2002). Indeed in all models that I tried with their data and the additional variables in Table 1, IQ remains the strongest independent predictor of GDP. If Mongoloids are brighter than Caucasoids, the industrial revolution should have taken place in East Asia rather than Europe!

Historical accident could be one explanation. But we also know that most Western societies experienced dysgenic fertility for intelligence since at least the time of the fertility transition in the late 19th century. Estimates of genetic selection differentials for IQ in the late 20th-century United States range between -0.35 and -0.8 IQ points per generation (Loehlin, 1997; Retherford and Sewell, 1988; Vining, 1995; Lynn, 1996). The selection differentials at the time of the fertility transition in the late 19th and early 20th centuries have most likely been larger than this (Lynn, 1996). Even if it turns out that the current disparity of 3 to 6 IQ points between East Asians and Europeans is genetic in origin it may well have evolved during the past two centuries, rather than the Ice Age as suggested by Lynn and Rushton.

Also, IQ is a very crude construct. The structure of intelligence appears to vary among human populations, with Mongoloids being better at visuo-spatial and mathematical tasks and Caucasoids better at verbal tasks (Lynn, 1987; Wainer, 1988). Some other cognitive abilities are not tapped by IQ tests at all. Social skills, for example, can vary independent of IQ (Baron-Cohen *et al.*, 1999). Cognitive abilities and personality traits that are not tapped by IQ tests can be as important as IQ

The Mankind Quarterly

for the cultural evolution of human populations.

Correlation with Latitude

When race and latitude are evaluated as joint predictors of IQ, both variables are highly significant predictors at the $P < 0.0001$ level. In other words, even within the same broad racial categories, those living at higher latitudes have higher IQs than those living in the tropics. When the races are evaluated separately, latitude correlates with IQ significantly for Caucasoids and Mongoloids but not Negroids. Also in models that include one of the additional variables in Table 1, race and latitude remain the two most powerful independent predictors.

The mechanism of the latitude effect is not known. An immediate effect of climate or some other close correlate of latitude on intellectual ability is unlikely because populations that were displaced into a different climate zone during recent centuries maintain the IQ that is typical for their country of origin. Thus, Lynn and Vanhanen (2002) report an IQ of 103 for Singapore Chinese although the IQs for Mongoloid populations native to the countries surrounding Singapore are close to 90.

This leaves two possibilities. Either climate has a cumulative effect on cultural evolution that manifests itself on a time scale of millennia, rather than decades to centuries; or climate-driven genetic selection has acted on a time scale of several millennia to change the frequencies of IQ-relevant genes.

Interestingly, latitude is related to brain size as well as IQ. Figure 1 shows the variation of cranial capacity among indigenous populations.

The map shows that cranial capacity correlates more with latitude than with race. For example, Koreans and Malays are both classified as Mongoloid, but the Koreans have big brains (and an IQ of 106) while the Malays have small brains (and an IQ of 92). Even in the New World there is a gradient of brain size between the arctic and the tropics. Only some of the differences in Figure 1 are related to body size (Beals *et al.*, 1984), and some may be related to the nutritional state of the measured skulls, but the overall pattern appears to be valid.

Cranial capacity closely parallels brain size in young individuals, which in turn correlates with intelligence at about 0.38 (Pearson's r) (Vernon *et al.*, 2000). The correlation between

brain size and intelligence among members of the same population is thought to be genetic in origin (Posthuma *et al.*, 2002), and there is most likely a causal arrow from big brains to high intelligence. Everything else being equal, a big brain can think better than a small brain. It is therefore likely that populations that have been selected for high intelligence have been selected for big brains as well.

Brain size and intelligence are likely to evolve faster than skin color because they are genetically more complex. There is never a shortage of genetic variation for intelligence on which natural selection can act. Skin color variation, by contrast, is thought to be controlled by a small set of genes (Barsh, 2003).

Standard of Living

The massive rise of IQ that took place in many countries over the past century shows conclusively that environmental effects can have a powerful effect on the average intellectual level of large populations. Presumably one or another aspect of “standard of living” is responsible for this secular trend: education, nutrition, health care, mass media, or, most likely, a combination of all of these.

Gross domestic product adjusted for purchasing power (GDP in Table 1) is an indicator for the population’s “standard of living”. If a high standard of living does indeed raise IQ test performance, then GDP should be an *independent* predictor of national IQ even when the effects of race and latitude are partialled out.

When race, latitude and GDP are used as co-predictors, GDP does indeed have an independent effect in predicting national IQ ($P = 0.0007$). In this model, race and latitude remain powerful independent predictors, each with $P < 0.0001$. Thus GDP is an important predictor, though not quite as important as latitude and race.

Conversely, IQ is the strongest independent predictor of GDP, usually with $P < 0.0001$ when evaluated along with the other variables in Table 1. Only a history of Communist rule is as potent as IQ, with ex-Communist countries having lower GDPs than expected from their IQs. This is in agreement with Lynn and Vanhanen’s contention that intelligence is the major determinant for the wealth of nations.

Together with the Flynn effect, these results suggest that the

causal arrow points both ways. High intelligence produces a high standard of living, which in turn raises intelligence even more. Thus intelligence and economic development are mutually reinforcing in a positive feedback loop.

This feedback loop explains two of the greatest mysteries of our time: the rapid progress of science, technology and economic development during the 20th century, which is indeed a major historical anomaly; and the rise in mental test performance that has become known as the Flynn effect.

This feedback loop between intelligence and standard of living can explain the great magnitude of the IQ differences between nations. It predicts that even in cases where genetic differences affecting mental ability are small, the observed phenotypic differences become amplified because the slightly more gifted populations achieve a higher standard of living which raises their measured intelligence even more, which in turn raises their standard of living yet further. Similar “amplifier effects” have previously been proposed as explanations for the Flynn effect (Dickens and Flynn, 2001).

Thus, factors that are correlated with race and geography are most important for the worldwide *pattern* of IQ variation among populations. Although some of these factors may be ecological or historical in nature, genetic explanations appear more plausible. However, the *magnitude* of the IQ differences is more directly related to the “standard of living”.

This conclusion is supported by the observation that low-IQ populations that are transplanted from their native countries into a high-IQ environment get brighter within a few generations. Thus African Americans score halfway between Africans and white Americans on IQ tests (Herrnstein and Murray, 1994), and it is still far from certain that environmental influences on mental development are truly equivalent for black and white Americans. Observations of immigrant populations in other countries point in the same direction. For example, second-generation immigrants from third-world countries in the Netherlands have higher IQs than their parents (te Nijenhuis and van der Flier, 2001).

Culture and History

Table 1 includes three cultural-historical variables: the predominant religion, a history of colonial rule, and a history of

Communist rule. Of these three variables, Communism fails altogether to predict national IQ in the worldwide sample when employed as a co-predictor with race and latitude.

Colonialism does not much better. In the raw data of Table 1, the average IQ of countries with a significant history of colonial rule is 77.1 versus an average of 95.9 for non-colonies ($P < 0.0001$). The difference of 18.8 points is reduced to 4.0 points when race and latitude are partialled out. This is only borderline significant ($P = 0.0566$).

The correlation with religion is moderately significant in a model with latitude and race as co-predictors ($P = 0.0077$), with Buddhists/Confucians and Christians outscoring Hindus and Muslims. Within the less heterogeneous Caucasoid subsample ($N = 39$ or 40 in different models) religion is the most powerful predictor of national IQ. With latitude, colonialism, Communist rule, or GDP as co-predictors, religion predicts IQ with $P < 0.0001$ in every case. In these models, latitude ($P = 0.0123$), GDP ($P = 0.0362$) and Communism ($P = 0.0256$) are borderline significant while colonialism does not predict at all.

Stabilizing Selection

Genetic drift predicts modest differences in “genotypic” intelligence between human populations while climate-driven selection predicts large differences. However, some observations suggest that the genetic differences for intelligence among populations may be quite small in most cases. These observations include the similarity in measured IQ between Europeans and East Asians, and the cross-generational rise in IQ that is almost universally observed when people migrate from a low-IQ country to a high-IQ country. Is there any “politically correct” mechanism at work that tends to equalize intelligence genes across populations?

Such a mechanism might actually exist. We know that many genetically influenced traits are subject to stabilizing selection. For example, all human populations have a very similar blood pressure. This is because everywhere in the world people with an average blood pressure are healthier than those with very high or very low blood pressure, and natural selection favors the golden mean by removing those genes that favor the extremes. Could a similar mechanism apply to human intelligence as well?

The idea that natural selection favors mediocre intelligence

over the extremes is not as crazy as it sounds. Under the conditions that prevailed in past millennia, in populations unaffected by a major Flynn effect, a certain minimal intelligence must have been required to survive and raise a family. In study after study historical demographers have found that before the advent of modern contraception, usually the wealthy had higher fertility and lower mortality than the poor (Lamson, 1935; Perrenoud, 1978; Volland and Chasiotis, 1998; Weiss, 1990).

We do not know how strong the correlation between wealth and intelligence was in historical populations, but by and large good thinking ability did certainly help to make a decent living. Nor do we know the heritability of intelligence in historical times, but there can be no doubt that then as now, both genes and environment were important.

However, in modern societies with their higher level of intelligence, the less educated and – in the few studies where IQ tests were employed – the less intelligent usually have more children (Lynn, 1996). Presumably bright people are more likely than the dull to perceive their reproduction as being under their own control, and they are more efficient in using the contraceptive options available to them. Ideally, we should be bright enough to survive but too stupid to control our fertility!

Populations that, for whatever reason, have more than their fair share of high-IQ genes are more likely than others to develop an advanced civilization with a rational mode of thinking and a contraceptive culture. Unlike infanticide, which used to be the principal method of family planning in many small-scale societies and even in some of the pre-industrial civilizations (Langer, 1974; Scrimshaw, 1984), contraception requires intelligence and foresight.

Wherever effective contraceptive practices are adopted as part of the local culture, they are bound to reduce disproportionately the reproduction of the brighter (though not necessarily wealthier) parts of the populace. On a worldwide scale we get selection against *low* intelligence in backward populations, and selection against *high* intelligence in the most advanced populations. Over the millennia, most between-population differences in the capacity for higher intelligence will be erased.

Although contraceptive practices were known in many small-scale societies, they were rarely if ever used on a large scale (Himes 1936). Many historical civilizations, however, did practice contraception on a large scale. The evidence is overwhelming for the history of Muslim civilization of the Middle East (Musallam, 1983; Omran, 1992), and the evidence is also strong for the classical Greek and Roman world (Hopkins, 1965/66; McLaren, 1990; Riddle, 1992). It is therefore likely that genetic selection against high intelligence did take place in these civilizations.

But are the few thousand years since the origin of the first high civilizations sufficient for significant changes in gene frequencies? Probably they are. For example, the ability for lactose digestion is common only in those human populations where dairying used to be important in the past. We do not know when dairying was invented, but it must have been sometime after the first domestication of goats and cattle 9000 years ago (Feldman and Cavalli-Sforza, 1989).

It has also been claimed that the frequency of the sickle cell mutation in tropical Africa correlates with the time since the introduction of settled farming from about 5000 years ago onward. The sickle cell trait protects against malaria, and sedentary farmers are more vulnerable to malaria transmission than mobile hunter-gatherers (Wiesenfeld, 1967). If natural selection can change the frequencies of genes for milk digestion and malaria resistance within a few thousand years, it is hard to argue that the same is not possible for the genes that affect our thinking.

Welcome to the Molecular Age

We still know next to nothing about the genetic variations that affect mental development in "normal" people. Therefore there can be no definitive evidence about their recent evolution and current distribution in human populations. But theory has to guide research, and we must develop hypotheses that can be tested once the genes have been found.

The hard part in the molecular genetics of human behavior is always the definition of a gene's phenotype: the spectrum of effects it induces, its interactions with other genes, and the environmental conditions under which its effects are expressed.

Once a relevant polymorphism is known, we can use

comparisons with other primate species to determine which allele is ancient and which one is newly evolved; the DNA diversity next to the "IQ gene" allows us to estimate when a new allele first appeared; and by comparing its prevalence in living populations we can make educated guesses about the possible selective forces to which it has been exposed in the recent past (Sabeti *et al.*, 2002). Signs of genetic selection driven by cultural conditions, such as mode of subsistence, family structure and birth control practices in historical time, are of particular interest to the anthropologist.

In favorable cases we will even be able to study intelligence-related genes in fossil remains. The study of ancient DNA is technically demanding, and only a small percentage of fossils still contain intact DNA (Hofreiter *et al.*, 2001). But even mitochondrial (though not nuclear) DNA of Neanderthals has been sequenced in a few instances (Gutiérrez *et al.*, 2002).

The aim of IQ population genetics is not to determine how different or similar human populations are. Its aim is to reconstruct the biological evolution of human intelligence and to track the evolutionary changes that are taking place in currently living populations. And it has to be done properly: one gene at a time. We cannot predict what the genes are going to reveal. Only one result is predictable: It's not as simple as we think.

References

- Barbujani, Guido, A. Magagni, E. Minch and L.L. Cavalli-Sforza
1997 An apportionment of human DNA diversity. *Proceedings of the National Academy of Science USA* 94: 4516-4519.
- Baron-Cohen, Simon, S. Wheelwright, V. Stone and M. Rutherford
1999 A mathematician, a physicist and a computer scientist with Asperger syndrome: performance on folk psychology and folk physics tests. *Neurocase* 5: 475-483.
- Barsh, Gregory S.
2003 What controls variation in human skin color? *PLOS Biology* 1 (1), electronically published at:
<http://www.plosbiology.org/plosonline/?request=get-document&doi=10.1371/journal.pbi>
- Beals, Kenneth L., C.L. Smith and S.M. Dodd
1984 Brain size, cranial morphology, climate, and time machines. *Current Anthropology* 25: 301-330.

- Bouchard, Thomas J.
1998 Genetic and environmental influences on adult intelligence and special mental abilities. *Human Biology* 70: 257-279.
- Brace, C. Loring
1999 An anthropological perspective on "race" and intelligence: the non-clinal nature of human cognitive capabilities. *Journal of Anthropological Research* 55: 245-264.
- Byrne, Majella, E. Agerbo, H. Ewald, W.W. Eaton and P.B. Mortensen
2003 Parental age and risk of schizophrenia. A case-control study. *Archives of General Psychiatry* 60: 673-678.
- Ceci, Stephen J.
1991 How much does schooling influence general intelligence and its cognitive components? A reassessment of the evidence. *Developmental Psychology* 27: 703-722.
- Cohn, Sanford J., C.M.G. Cohn and A.R. Jensen
1988 Myopia and intelligence: a pleiotropic relationship? *Human Genetics* 80: 53-58.
- Crow, James F.
2000 The origins, patterns and implications of human spontaneous mutation. *Nature Reviews Genetics* 1: 40-47.
- Dickens, William T. and J.R. Flynn
2001 Heritability estimates versus large environmental effects: the IQ paradox resolved. *Psychological Review* 108: 346-369.
- Egan, Michael F., T.E. Goldberg, Bh.S. Kolachana, J.H. Callicott, Ch.M. Mazzanti, R.E. Straub, D. Goldman and D.R. Weinberger
2001 Effect of COMT Val^{108/158} Met genotype on frontal lobe function and risk for schizophrenia. *Proceedings of the National Academy of Science USA* 98: 6917-6922.
- Egan, Michael F., D.R. Weinberger and B. Lu
2003 Brain-derived neurotrophic factor and genetic risk. *American Journal of Psychiatry* 160: 1242.
- Engle, Randall W., S.W. Tuholski, J.E. Laughlin and A.R.A. Conway
1999 Working memory, short-term memory, and general fluid intelligence: a latent-variable approach. *Journal of Experimental Psychology: General* 128: 309-331.
- Feldman, M.W. and L.L. Cavalli-Sforza
1989 On the theory of evolution under genetic and cultural transmission with application to the lactose absorption problem. In: M.W. Feldman (ed): *Mathematical Evolutionary Theory*, pp. 145-173. Princeton (NJ): Princeton University Press.
- Fernandez, Maria
2001 A study of the intelligence of children in Brazil. *Mankind Quarterly* 42: 17-20.
- Flynn, James R.
1984 The mean IQ of Americans: massive gains 1932 to 1978. *Psychological Bulletin* 95: 29-51.
- Flynn, James R.
1987 Massive IQ gains in 14 nations: what IQ tests really measure. *Psychological Bulletin* 101: 171-191.

- Fuster, Joaquín M.
2003 *Cortex and Mind. Unifying Cognition*. Oxford, New York: Oxford University Press.
- Goesling, Brian
2001 Changing income inequalities within and between nations: new evidence. *American Sociological Review* 66: 745-761.
- Gutiérrez, Gabriel, D. Sánchez and A. Marín
2002 A reanalysis of the ancient mitochondrial DNA sequences recovered from Neandertal bones. *Molecular Biology and Evolution* 19: 1359-1366.
- Herrnstein, Richard and Ch. Murray
1994 *The Bell Curve. Intelligence and Class Structure in American Life*. New York: Free Press.
- Himes, Norman E.
1936 *Medical History of Contraception*. Baltimore: Williams & Wilkins.
- Hofreiter, Michael, D. Serre, H.N. Poinar, M. Kuch and S. Pääbö
2001 Ancient DNA. *Nature Reviews Genetics* 2: 353-359.
- Hopkins, Keith
1965/66 Contraception in the Roman empire. *Comparative Studies in Society and History* 8: 124-151.
- Ingman, Max, H. Kaessmann, S. Pääbö and U. Gyllensten
2000 Mitochondrial genome variation and the origin of modern humans. *Nature* 408: 708-713.
- Jensen, Arthur R.
1980 *Bias in Mental Testing*. New York: Free Press.
- Kayser, Manfred, S. Brauer and M. Stoneking
2003 A genome scan to detect candidate regions influenced by local natural selection in human populations. *Molecular Biology and Evolution* 20: 893-900.
- Kyllonen, Patrick C.
1996 Is working memory capacity Spearman's g? In: I. Dennis and P. Tapsfield (eds): *Human Abilities: Their Nature and Measurement*, pp. 49-75. Mahwah (NJ): Erlbaum.
- Lamson, Herbert D.
1935 Differential reproduction in China. *Quarterly Review of Biology* 10: 308-321.
- Langer, William L.
1974 Infanticide: a historical survey. *History of Childhood Quarterly* 1: 353-365.
- Loehlin, John C.
1997 Dysgenesis and IQ. What evidence is relevant? *American Psychologist* 52: 1236-1239.
- Lynn, Richard
1987 The intelligence of the Mongoloids: a psychometric, evolutionary and neurological theory. *Personality and Individual Differences* 8: 813-844.
- Lynn, Richard
1990 The role of nutrition in secular increases in intelligence. *Personality and Individual Differences* 11: 273-285.

- Lynn, Richard
1991 The evolution of racial differences in intelligence. *Mankind Quarterly* 32: 99-121.
- Lynn, Richard
1996 *Dysgenics: Genetic Deterioration in Modern Populations*. New York: Praeger.
- Lynn, Richard and S. Hampson
1986 The rise of national intelligence: evidence from Britain, Japan and the U.S.A. *Personality and Individual Differences* 7: 23-32.
- Lynn, Richard and T. Vanhanen
2002 *IQ and the Wealth of Nations*. Westport (Conn.): Praeger.
- Marth, Gabor and 19 coauthors
2003 Sequence variations in the public human genome data reflect a bottlenecked population history. *Proceedings of the National Academy of Science* 100: 376-381.
- McLaren, Angus
1990 *A History of Contraception. From Antiquity to the Present Day*. Oxford, Cambridge (Mass.): Basil Blackwell.
- Miller, A.K.H. and J.A.N. Corsellis
1977 Evidence for a secular increase in human brain weight during the past century. *Annals of Human Biology* 4: 253-257.
- Miller, Edward M.
1996 The evolution of Australoid and Amerindian intelligence. *Mankind Quarterly* 37: 149-186.
- Musallam, B.F.
1983 *Sex and Society in Islam. Birth Control before the Nineteenth Century*. Cambridge, New York: Cambridge University Press.
- Nachman, Michael W. and S.L. Crowell
2000 Estimate of the mutation rate per nucleotide in humans. *Genetics* 156: 297-304.
- Omran, Abdel Rahim
1992 *Family Planning in the Legacy of Islam*. London, New York: Routledge.
- Perrenoud, Alfred
1978 Die soziale Ungleichheit vor dem Tod in Genf im 17. Jahrhundert. In: Arthur E. Imhof (ed): *Biologie des Menschen in der Geschichte*. Stuttgart: Friedrich Frommann Verlag.
- Plomin, Robert and I. Craig
2001 Genetics, environment and cognitive abilities: review and work in progress towards a genome scan for quantitative trait locus associations using DNA pooling. *British Journal of Psychiatry* 178 (suppl. 40): s41-s46.
- Plomin, Robert and F.M. Spinath
2002 Genetics and general cognitive ability (g). *Trends in Cognitive Sciences* 6: 169-176.
- Posthuma, Daniëlle, E.J.C. De Geus, W.F.C. Baaré, H.E. Hulshoff Pol, R.S. Kahn and D.I. Boomsma
2002 The association between brain volume and intelligence is of genetic origin. *Nature Neuroscience* 5: 83-84.

- Relethford, John H.
 2002 Apportionment of global human genetic diversity based on craniometrics and skin color. *American Journal of Physical Anthropology* 118: 393-398.
- Retherford, Robert D. and W.H. Sewell
 1988 Intelligence and family size reconsidered. *Social Biology* 35: 1-40.
- Riddle, John M.
 1992 *Contraception and Abortion from the Ancient World to the Renaissance*. Cambridge (Mass.): Harvard University Press.
- Rushton, J. Philippe
 1995 *Race, Evolution, and Behavior*. New Brunswick: Transaction Publishers.
- Sabeti, Pardis C. and 16 coauthors
 2002 Detecting recent positive selection in the human genome from haplotype structure. *Nature* 419: 832-837.
- Scrimshaw, Susan C.M.
 1984 Infanticide in human populations: societal and individual concerns. In: G. Hausfater and S.B. Hrdy (eds): *Infanticide. Comparative and Evolutionary Perspectives*, pp. 439-462. New York: Aldine.
- Te Nijenhuis, Jan and H. van der Flier
 2001 Group differences in mean intelligence for the Dutch and third world immigrants. *Journal of Biosocial Science* 33: 469-475.
- Underhill, P.A., G. Passarino, A.A. Lin, P. Shen, M. Mirazón Lahr, R.A. Foley, P.J. Oefner and L.L. Cavalli-Sforza
 2001 The phylogeography of Y chromosome binary haplotypes and the origins of modern human populations. *Annals of Human Genetics* 65: 43-62.
- Venter, J. Craig and 263 coauthors
 2001 The sequence of the human genome. *Science* 291: 1304-1351.
- Vernon, Philip A., J.C. Wickett, P.G. Bazana and R.M. Stelmack
 2000 The neuropsychology and psychophysiology of human intelligence. In: R.J. Sternberg (ed): *Handbook of Intelligence*. Cambridge, New York: Cambridge University Press.
- Vining, Daniel R. Jr.
 1995 On the possibility of the reemergence of a dysgenic trend with respect to intelligence in American fertility differentials: an update. *Personality and Individual Differences* 19: 259-263.
- Voland, Eckart and A. Chasiotis
 1998 How female reproductive decisions cause social inequality in male reproductive fitness. Evidence from eighteenth- and nineteenth-century Germany. In: S.S. Strickland and P.S. Shetty (eds): *Human Biology and Social Inequality*, pp. 220-238. Cambridge, New York: Cambridge University Press.
- Wainer, Howard
 1988 How accurately can we assess changes in minority performance on the SAT? *American Psychologist* 43: 774-778.
- Weiss, Volkmar
 1990 Social and demographic origins of the European proletariat. *Mankind Quarterly* 31: 127-151.

White, Tim D., B. Asfaw, D. DeGusta, H. Gilbert, G.D. Richards, G. Suwa and F.C. Howell

2003 Pleistocene *Homo sapiens* from Middle Awash, Ethiopia. *Nature* 423: 742-747.

Wiesenfeld, S.L.

1967 Sickle cell trait in human biological and cultural evolution. *Science* 157: 1135-1140.

Zhivotovsky, Lev A., N.A. Rosenberg and M.W. Feldman

2003 Features of evolution and expansion of modern humans, inferred from genomewide microsatellite markers. *American Journal of Human Genetics* 72: 1171-1186.

Fig. 1:

Average cranial capacities of indigenous populations, sex-combined means. Black: 1450 cc. and over; checkerboard: 1400-1449; crosshatching: 1350-1399; horizontal striping: 1300-1349; diagonal striping: 1250-1299; dots: 1200-1249. From Beals et al., 1984.

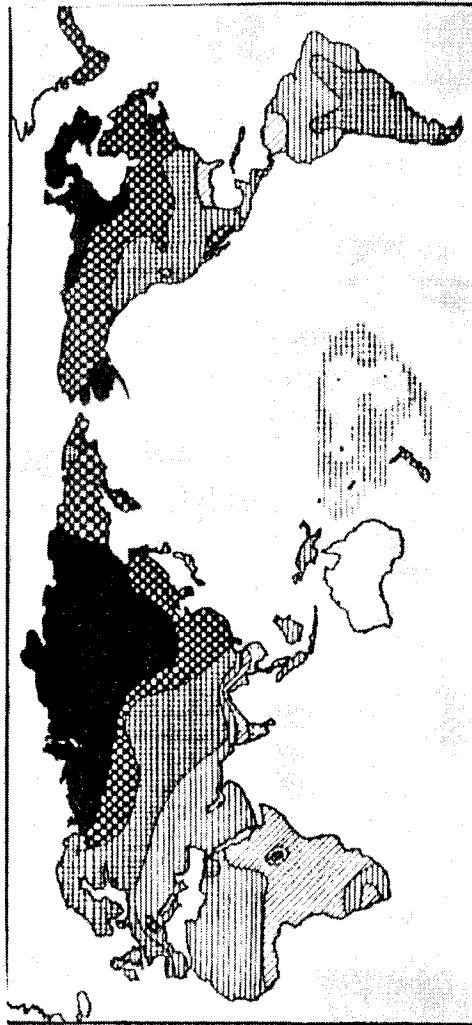


Table 1:

Variables related to the performance on mental tests. IQ = average IQ of the population; Lat = latitude at which the population has lived historically; Race: C = European Caucasoid, C = non-European Caucasoid, M = Northeast Asian Mongoloid, M* = Southeast Asian Mongoloid, N = Negroid; Rel = Religion: B = Buddhist/Confucian, Ch = Christian, H = Hindu, Mo = Muslim; GDP = per-capita gross domestic product, measured at purchasing power parity; Col = history of colonial rule; Com = history of Communist rule. For further explanations, see text.*

Country	IQ	Lat	Race	Rel	GDP	Col	Com
Hong Kong	107	22	M	B	20763	1	0
South Korea	106	37	M	B	13478		0
Japan	105	36	M	B	23257	0	0
Taiwan	104	24	M	B	13000	0	0
West Germany	103	52	C	Ch	24476	0	0
Singapore (Chinese)	103	1	M	B		1	0
Austria	102	48	C	Ch	23166	0	0
Italy	102	42	C	Ch	20585	0	0
Netherlands	102	52	C	Ch	22176	0	0
Sweden	101	59	C	Ch	20659	0	0
Switzerland	101	47	C	Ch	25512	0	0
Belgium	100	51	C	Ch	23223	0	0
China	100	33	M	B	3105	0	1
New Zealand	100	48	C	Ch	17288	0	0
United Kingdom	100	53	C	Ch	20336	0	0
Hungary	99	47	C	Ch	10232	0	1
Poland	99	52	C	Ch	7619	0	1
Denmark	98	56	C	Ch	24218	0	0
France	98	48	C	Ch	21175	0	0
Norway	98	61	C	Ch	26342	0	0
Canada	97	48	C	Ch	23582	0	0
Czech Republic	97	50	C	Ch	12362	0	1
Finland	97	62	C	Ch	20847	0	0
Spain	97	40	C	Ch	16212	0	0
Argentina	96	40	C	Ch	12013	0	0
Russia	96	55	C	Ch	6460	0	1
Slovakia	96	49	C	Ch	9699	0	1
Uruguay	96	40	C	Ch	8623	0	0
East Germany	95	52	C	Ch	7408	0	1
Portugal	95	40	C	Ch	14701	0	0
Slovenia	95	46	C	Ch	14293	0	1
Romania	94	45	C	Ch	5648	0	1
Bulgaria	93	43	C	Ch	4809	0	1
Ireland	93	53	C	Ch	21482	0	0
Greece	92	38	C	Ch	8137	1	0
Singapore (Malays)	91	1	M*	Mo		1	0

(Table 1 cont.)

Country	IQ	Lat	Race	Rel	GDP	Col	Com
Thailand	91	15	M*	B	5456	0	0
Croatia	90	45	C	Ch	6749	0	1
Turkey	90	39	C*	Mo	6422	0	0
Indonesia	89	6	M*	Mo	2651	1	0
Iraq	87	33	C*	Mo	3197	1	0
Lebanon	86	34	C*	Mo	4326	1	0
Philippines	86	12	M*	Ch	3555	1	0
Fiji (Indians)	84	23	C*	H	4231	1	0
Iran	84	34	C*	Mo	5121	0	0
Egypt	83	29	C*	Mo	3041	1	0
S. Africa (Indians)	83	23	C*	H		1	0
India	81	23	C*	H	2077	1	0
Barbados	78	8	N	Ch	12001	1	0
Nepal	78	28	C*	H	1157	0	0
Qatar	78	25	C*	Mo	20987	1	0
Zambia	77	15	N	Ch	719	1	0
Congo (Brazz.)	73	3	N	Ch	995	1	0
Uganda	73	0	N		1074	1	0
Jamaica	72	8	N	Ch	3389	1	0
Kenya	72	0	N	Ch	980	1	0
Sudan	72	15	N	Mo	1394	1	0
Tanzania	72	6	N	Ch	480	1	0
Brazil (Blacks)	71	8	N	Ch		0	0
Ghana	71	8	N	Ch	1735	1	0
Nigeria	67	8	N		795	1	0
S. Africa (Blacks)	66	30	N	Ch		1	0
Guinea	66	10	N	Ch	1782	1	0
Zimbabwe	66	18	N	Ch	2669	1	0
Congo (Zaire)	65	3	N	Ch	822	1	0
Sierra Leone	64	8	N	Ch	458	1	0
Equatorial Guinea	59	2	N	Ch	1817	1	0

This table does not include data on Australoids or the remnants of the ancient Negrito populations that formerly occupied much of Southeast Asia. It is the opinion of most traditional anthropologists (cf. Carleton Coon) that the present days peoples of Southeast Asia are the descendants of immigrant waves of Mongoloids who absorbed earlier Australoid, and to a lesser extent Negrito, aboriginal populations. Richard Lynn, in *The Geography of Intelligence*, (H. Nyborg (Ed.), *The Scientific Study of General Intelligence*, Amsterdam: Elsevier, 2003) treats Malays, Thais and Philippines as a separate race of SE Asians. In doing this, he follows Cavalli-Sforza, L.L., Menozzi, P and Piazza, A. (1994) *The History and Geography of Human Genes*. Princeton, NJ: Princeton University Press.(p156)

Southeast Asian peoples have therefore been designated separately from Northeast Asian Mongoloids by the addition of an asterisk after the letter M (signifying Mongoloid) in the Race column (i.e. M* implies Southeast Asian, an M alone signifies Northeast Asian Mongoloid).

Substantial distinctions also mark the genetic gradient that links European Caucasoids to North African and South Asian Caucasoids, and C* implies North African or Southeast or South Asian Caucasoid, as distinct from the European Caucasoid populations, identified by the letter C without an asterisk.

Some Further Thoughts on the Subject of IQ Population Genetics

J. W. Jamieson¹

Council for Social and Economic Studies

The author notes the challenging paper by Gerhard Meisenberg published in this issue of the journal, and makes a number of additional observations which he believes serve to further clarify the causal relationship between the evolutionary history of living human populations and IQ population genetics.

Key Words: IQ, human evolution, mutations, natural selection, speciation, geographical races, ethnic groups, communism, colonialism, latitude and IQ, religion and IQ, heritability, dysgenics, the Flynn Effect.

Certainly the question of cognitive differences between human populations is a contentious topic, but that is only because the evolution of living populations is a poorly understood and, indeed, unpopular concept in contemporary Western academe. This is primarily due to the failure of geneticists to familiarize themselves with established evolutionary studies, believing that their statistics are all that they need to recreate the evolutionary history of living human populations, and also because of the already extensive impact of genetic admixture on so many living populations is too seldom taken into account when gathering IQ statistics. For example, the IQ of American whites is customarily stated to be 100, but probably millions of those who may describe themselves as white for classificatory purposes, when completing the questionnaires on which genetic statistics relating to ethnic and racial origin are based, are actually of relatively recent hybrid origin. Consequently it is not surprising that the IQ of American whites in mid-Western states which are known to be less hybridized, such as Minnesota, actually averages several points above 100.

Yet IQ population genetics is certainly a valid area for academic research, and the fact that it has not yet become an *accepted* area of scientific enquiry is probably due more to political bias against debating genetically-based differences in human ability than to any other reason. A high level of intelligence is a prerequisite for the creation and maintenance

¹ Send correspondence to author at soccecon@aol.com

of any advanced civilization, and precisely because of this many kindly people feel that IQ comparisons are invidious. However, none can deny that one of the prime developments in the course of human evolution has been the increase in intelligence. Intelligence has replaced tooth and claw, muscular strength, and even physical abilities in such directions as running and jumping, as humankind's key to survival.

While stressing the importance of intelligence as measured by IQ tests, I would also like to observe that intelligence is not the sole mental attribute of importance. So also is the evolved ability to direct attention and activity towards specific long-term goals – the ability to prevent every immediate stimulus from distracting the human individual from coordinated action aimed at the attainment of specific goals. Individuals who seek only instant gratification, and are unable to direct their energies toward the attainment of preconceived, long-term goals, will achieve little in life. While intelligence does not rest primarily in the frontal lobes, it is the development of the frontal lobes that seems to regulate and coordinate rational behavior. The physical evidence of paleontology shows how the skull has grown in size to accommodate a larger, more intelligent brain, and at the same time it also reveals the evolutionary development of the frontal lobes. The traditional conceptual distinction between “lowbrows” and “highbrows” is in a roundabout way rooted in physiological fact – not perhaps on a direct one-to-one basis between living individuals, but certainly as evidenced by hominid evolution through the ages.

Evolutionary Disparities

As Rushton¹ and Lynn² have suggested, the movement of human populations into new and challenging environments places a selective value on intelligence. The intelligence of Pygmies, who have become well adapted to the challenge of survival in the equatorial forests of Africa which have been their home for untold generations, has evolved to a level that enables them to obtain in a few hours of hunting and collecting all the food they need to last them for several days in the well-stocked

¹ See Rushton, J. Philippe, 1995. *Race, Evolution, and Behavior*. New Brunswick: Transaction Publishers.

² See Lynn, Richard, 1991. The evolution of racial differences in intelligence. *Mankind Quarterly* 32: 99-121.

tropical rain forests of Central Africa. But the prehistoric migrants who found themselves on the very fringes of habitable land in Northern Eurasia had to invent ways to obtain food in the summer and store it for the winter. They had to devise warm clothing and habitations suitable for the harsh new environment. By the account of Rushton and Lynn, it was not an accident that higher intelligence tends to be correlated to lightness of skin color, both, although causally independent of each other, having evolved as adaptive responses to the same new environmental conditions. This is not to say that harsh climates are the only evolutionary spur to higher intelligence and to the ability to concentrate on long-term objectives while suppressing the temptation to abandon these in favor of instant gratification, a path much less conducive to survival. Cognitive advancement can result from any environmental challenge that does not totally overwhelm and eliminate the human population facing it.

Human Diversity in Prehistory

Evolutionary adaptation generally proceeds more rapidly in small groups than in large groups, and several writers have suggested that further evolutionary progress amongst humans will be slowed by the very size of today's massive human populations.

In his paper entitled *IQ Population Genetics: It's Not as Simple as You Think*, published in this issue of *Mankind Quarterly*, Meisenberg correctly states that modern humans may have evolved from an originally small population base, although this is not to say that at any one time there was a single, uniform hominid population inhabiting the earth. The popular talk of an early human "Eve" has led many who write on this subject to form and perhaps unconsciously disseminate a false image of a single female progenitor of all living peoples. At all times in human prehistory it is reasonable to assume that there were a number of human groups spread out over quite extensive areas, even before any human migrants had moved out of the tropical environments in which we must assume that our *earliest* progenitors evolved.²

² It is worth mentioning here that any movements into Eurasia would most probably have been by way of the Horn of Africa, or further north from the area now known as Egypt, and certainly not directly from the tropical rain forests

The extreme form of the "Out of Africa" theory holds that all living humans evolved from a single mutant female living sometime between 50,000 and 150,000 years ago, whose descendants later become diversified into the contemporary races of man. This is by no means established, either in regard to the conjectural time period or even the implication that there was no genetic admixture with older human or proto-human populations already resident outside Africa. There are many questions that have not yet been answered. The shovel-shaped incisors that characterize pre-modern human fossil remains in Northeastern Asia and that are also to be found amongst modern humans in the same area, for example, suggest that the living Mongoloids of this area inherited some genes at least from earlier pre-modern humans.

Such evidence conflicts with the opinion of those "Out of Africa" theorists who believe that the first "modern men" were essentially racist, in that they avoided hybridizing their stock by admixture with other more primitive hominids. I have been criticized for supporting Sir Arthur Keith's view that human advancement was often aided by just that same willingness to supplant less competent hominid populations, rather than admix with them. But it is a well-established precept of mammalian ethology that in a natural state observable physical differences that mark one subspecies from another do discourage genetic intermixture when different subspecies that have evolved in geographically distinct environments come into contact with each other. These physiological deterrents break down when feral patterns of existence are lost. Thus domesticated animals, and also animals caged in zoos, will tend to freely crossbreed; but that is not what happens in a feral environment – the evolutionary diversification of advanced mobile organisms such as mammals, birds and fishes would never have been possible if every new evolutionary experiment had come to an untimely end by reabsorption into the parent stock. Genetic or "racial" discrimination is the prime basis of evolutionary diversification, and has played an important role in

occupied by proto-Negroes. The inhabitants of the African continent were by that time already widely differentiated, and the inhabitants of the mountain and savannah areas from which the migrants moved into Eurasia were already genetically different from the inhabitants of the sub-Saharan rain forests. In late prehistoric times the savanna terrain to the east of the tropical rain forest was occupied by a population akin to the contemporary Bushmen.

The Mankind Quarterly

evolutionary progress. The debate between the unilineal and the multilineal has not yet been finally resolved, although we may expect that the two views will eventually be reconciled as the picture becomes more clear to us.

In this connection, it might be observed that what is today popularly called "racism" has long played a prominent role in the evolution of advanced mobile species of mammals (and, incidentally, also of birds) in that it promoted speciation. I use the term speciation here to refer to the process by which selective forces cause genetically isolated populations to evolve subspecific differences, thereby becoming separate subspecies, and from thence into separate species. Only if genetic isolation and differential selection continues over a sufficient number of generations will the resultant subspecies evolve into totally different species, i.e. lose the ability to produce offspring when mated with partners from other groups. The term "race" may be, and has been, applied in zoological discourse to both subspecies and species, but when used in reference to human populations it must of necessity imply only subspecific differences.³

As phylogenetic continua, human races are essentially descent groups that can be clearly distinguished only to the extent that they may be predominantly inbreeding; but because human beings are universally interfertile, the borders of any race usually tend to be "fuzzy," becoming more so in recent times due to the increasing demographic mobility of the species. In practice, therefore, from the point of view of population genetics we can define races as predominantly inbreeding descent groups that differ from other groups in the frequency of a number of genes.

The degree to which the earliest modern hominid subspecies might have interbred is the subject of considerable debate, with inconclusive results at this time. As early humans moved away from feral conditions, hybridization of diverse populations probably became more frequent. In Paleolithic times, geographical barriers and even simply geographical distance were sufficient to promote speciation; but with more sophisticated technologies and subsistence methods, the total

³ For an excellent discussion of this subject, see Goran Strkalj, *Form and Race: Terminological Concepts for the Study of Human Variation*, *Mankind Quarterly*, Volume XLI No 1, Fall 2000.

world population of humans increased, and intergroup contacts became more common. Certainly we find evidence of frequent genetic admixture of competing groups by the time of the Neolithic, especially with the advent of slavery. Hunting and gathering groups may have absorbed a few females from rival populations into their population pool, but would have sought to kill male enemies. When hunting, a captor would hardly be likely to have given a spear to a captive male with the instruction: "follow me." But Neolithic cultivators and animal herders could make good use of captive male labor, while keeping the spear in their own hands. From there it was but a short step to increased wealth by breeding more slave-workers, with inevitable changes in the eventual content of the gene pool.

Popular Misinterpretation of the "Out of Africa" Thesis

One weakness in the conventional Out of Africa argument is the brief time span that many geneticists have favored. While it is perhaps premature to reject altogether attempts to estimate the number of generations, and from that to postulate the timespan since the migrants to Eurasia left Africa, it is essential to remember that these are only "guesstimates" based on the assumption that mutations occur at a fairly regular rate. However, the concept of punctuated evolution suggests that the rate of mutation was not always constant, and that there have been many cases of spasmodic and very rapid evolutionary change in the history of most advanced, complex living organisms. The frequency of mutation could have been affected by changes in the environment, including even such things as strong bursts of cosmic radiation.

A parallel is to be found in the history of Carbon 14 dating. It was formerly thought that Carbon 14 breaks down at a regular rate, but when Colin Renfrew compared samples of wooden artifacts surviving from cultures that had flourished several thousand years ago, with samples of wood from long-lived trees that could be specifically dated by dendrochronology or tree ring calibration, a disparity was found that confirmed that the rate of Carbon 14 decay was not constant, but could be affected by cosmic conditions. This made it necessary to adjust all Carbon 14 datings, with significant effects on our understanding of prehistory. The belief that the megalithic tradition of Western Europe had been derived from North Africa had to be

abandoned. The megaliths of Britain and Brittany were found to be older than those of Spain and North Africa, and it became known that any cultural transfer had been from north to south, rather than the reverse.

Similarly, some glottochronologists had formerly argued that it was possible to date languages on the assumption that languages changed at a fairly constant rate. This theory has since been abandoned, because it has now been accepted that historical experiences (such as contact with other languages) could disrupt the normal rate of linguistic drift that might otherwise characterize intergenerational linguistic change in isolated communities.

In short, there is no sound reason to believe that estimates as to the date at which the ancestors of the contemporary populations of Eurasia may have left a supposed African homeland are accurate. Indeed, many argue that there would likely have been numerous such Out of Africa migrations. Also, we should note, there is evidence that the present-day population of large areas in Eastern Africa are actually hybrid descendants of Eurasian peoples who moved back into Africa, bringing with them more advanced cultural attributes, including not only superior tools but also arts such as cattle-herding. The present-day population of North Africa is primarily of Caucasoid Eurasian origin, possibly modified in prehistoric times by absorption of genes from the indigenous Bushmanoid population (which once extended over much of that continent outside the equatorial rain forests of West and Central sub-Saharan Africa, occupied by Negroids); and modified, also, in historical times by slave-trading and the acquisition of genes from slave women of Negroid sub-Saharan Africa origin – something that is still taking place in the Sudan today, and which has also substantially modified a large part of the so-called Caucasoid population of North Africa and the Middle East.

Human Genetic Diversity

There is a great deal of miscomprehension – and sometimes even deliberate misrepresentation – regarding the extent and significance of the genetic dissimilarities that characterize different human population groups. One must remember that the genetic difference between men and chimpanzees is estimated at only 2-3%. That is to be expected, because both are

not only animals, but mammals, and also primates. But that small percentage is responsible for vast physiological, mental and behavioral differences and potentials.

Where contemporary discussion of IQ and race does become truly confused is in the semantic fog that prevails as to what is meant by "race." Too many writers seem to think that the concept of race merely refers to three, four or five major "geographical" races. An oversimplification of this type causes undue confusion. When one attempts to group all the divergent populations of the world into just three main categories, it is not surprising that observers will query the validity of comparisons made on such a faulty basis. If one lumps Malays and Chinese together as members of the major geographical race known Mongoloid, and then expects them to be genetically the same, one has created a straw man: easily demolished. Malays are very different from Chinese, having smaller brains, and performing very poorly in competition with the numerous Chinese who reside in Malaya. Thus Meisenberg and authoritative scholars break the so-called major geographical races down into smaller, more realistic component groups, starting with the distinction between Northeastern Asians and Southeastern Asians, and if serious, continuing this critical scrutiny down the very smallest breeding populations.

In the nineteenth century, when understandable attempts were being made to make sense out of observable racial differences by identifying distinctive racial categories, most Southeast Asians were loosely classed as Mongoloids because they appeared to be more Mongoloid than Caucasoid, Negroid or Australoid. This was not an unreasonable decision, but it has led many observers falsely to assume that all populations loosely classed as Mongoloid must be racially similar, and has led to a whole host of meaningless statistical collations. The broad and very primitive nineteenth century attempt to identify major geographical races may serve as a popular classificatory tool, but it is the micro-race, the breeding population, that is important to a proper understanding of human group differences. Most of the humans who dwell in the Far East have been popularly labeled Mongoloid, but in fact the Far East is home to an enormous variety of different racial strains which in the course of history have become genetically intermixed in intermediate areas. Because of subsequent local inbreeding these mixed

The Mankind Quarterly

populations have themselves evolved into new, identifiable micro-races. Chinese, Vietnamese, Thais, Cambodians and Malays, for example, are all different from each other, and even within these broad categories smaller gene pools can be identified. China itself comprises a vast variety of different sub-races, and the much smaller population of Tibet, now regarded as part of China, can be broken down into a wide variety of yet smaller micro-races, with the occupants of different valleys often being easily distinguished from each other.

Races are essentially inbreeding descent groups, distinctive phylogenetic continua analogous to taxonomic subspecies only to the extent that they may constitute separate breeding populations that differ from other populations in the frequencies of one or more genes. As the distinguished Harvard anthropologist Carleton Coon pointed out some decades before genetic research confirmed the findings of traditional physical anthropology, in the real world neighboring breeding populations tend to merge into each other in phenotype and genotype for two reasons. In the first place, a founder population which in prehistory spread out over a wide area characterized by differing environments would tend to evolve *intra-racial* differences due to the different selective forces associated with each of the different environments in which local groups now found themselves. Thus the descendants of the originally homogeneous population at one end of the spectrum would begin to evolve differently from those inhabiting the other end of the territory, resulting in a genetic gradient, which Coon called an *intra-racial cline*. Speciation was at work: new variant populations were evolving. Alternatively, when two sharply different populations chanced to meet and became genetically hybridized, this would create a somewhat similar genetic gradient between the two extremes, which Coon described as an *inter-racial cline*.

The traditional racial groups identified by Carleton Coon, W.W. Howells and other physical anthropologists on the basis of outwardly observable physical characteristics are virtually identical to those groupings perceived by present day geneticists. Thus the major geographical continental population groupings identified by Howell, on the basis of traditional physical anthropology are matched perfectly by those identified by Cavalli-Sforza based on differing genetic frequencies, as we

may see below:⁴

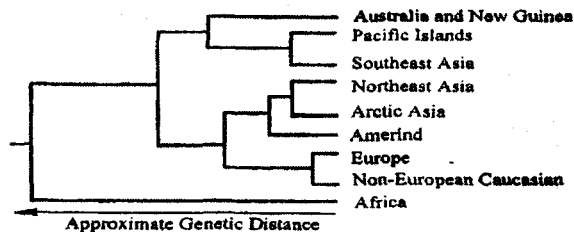
Howell

African (sub-Saharan)
European Caucasoid
Northeast Asian/Japanese
Southeast Asian
Eskimo, Ainu
Polynesian
Australian/New Guinea

Cavelli-Sforza

African (sub-Saharan)
European
Northeast Asian
Southeast Asian
Arctic North Asian
Pacific Islands
Australian/New Guinea

Cavelli-Sforza, who is particularly careful to condemn popular misconceptions as to the nature of race, preferring even to avoid using the term, has nevertheless provided us with a wealth of genetic data about the genetics of human populations, which merely confirms the reality of the term "race" when used in the original sense of a breeding population or "descent group." Thus in his 1995 publication⁵ he published a concise dendrogram illustrating the varying degrees of genetic relationship between the major geographical population clusters (i.e. races) as follows:



⁴ Compare L.L. Cavelli-Sforza et al, *The History and Geography of Human Genes*, Princeton University Press, 1994 with W.W. Howells, *Getting Here: The Story of Human Evolution*, Compass Press, 1993.

⁵ L.L. Cavelli-Sforza and F. Cavelli-Sforza, *The Great Human Diaspora: The History of Diversity and Evolution*, Addison-Wesley, 1995

Causes of Differences in the IQ of Populations

Meisenberg quotes C. Loring Brace, a committed egalitarian, as claiming that intelligence "is of equal survival value to all human groups, and consequently there is no valid reason to expect that there should be average differences in intellectual ability among living human populations" and correctly questions that statement on the ground that selection does not always favor high intelligence.

However, I would add that while we may justifiably assume that greater intelligence would normally be of survival value to any human group, it is quite unreasonable to suppose that selective pressures favoring higher intelligence have been of uniform strength in all parts of the world and at all times. As Arthur Jensen has written:

Given that perhaps as many as 50 percent of the genes in the human genome are involved with the structural and functional aspects of the brain, it would be surprising indeed if populations that differ in a great many visible characteristics and in various genetic polymorphisms did not also differ in some characteristics associated with the brain, the primary organ of behavior...so we shouldn't be surprised if these races, or population clusters if you prefer, differ in a number of behavioral characteristics, including abilities, both physical and mental as well. It's as legitimate and necessary for differential psychology to study psychometric differences between these groups as it is for forensic anthropology to study their skeletal and dental differences, geneticists to study their blood group and immunological differences, or research physicians and pharmacologists to determine dosage curves.⁵

Human populations that evolved in tropical forests would have been well-adapted to survive in those conditions. Having evolved the qualities that ensured their survival in such conditions, where food was plentiful, they would experience little selective pressure for further change unless there were a significant change in their environment. But the populations that moved out of Africa encountered very different environments. Some moved primarily eastwards through Asia, seldom moving out of the tropical belt, and the Negrito of the tropical forest of Southeast Asia resembles African Negroes in many survival-oriented ways. But migrant populations that moved from Africa into more northerly portions of Eurasia

found themselves in harsher climates, subject to wider annual variations, and these had to evolve in many ways to meet the quite different environmental challenge of their new homelands. Under severe selective pressure, they could have evolved quite rapidly into the Caucasoid and Mongoloid populations we know today.⁶

Yet it is easy to oversimplify racial categories, if one casually assumes that all populations broadly classed as Mongoloid, Caucasoid, Negroid or Australoid are similar. Cambodians, for example, combine Mongoloid characteristics with Australoid qualities, either as a result of genetic admixture, or as part of an ancient intraracial cline. Indeed, there is evidence that Australoid-like populations once existed in Southeast Asia and even Southern China., and the Chinese of Southeastern China similarly inherit many of their genes from an older population that inherited the mountain valleys of this region before the arrival of true Mongoloids from Northern China some two thousand or more years ago. Likewise, the Turkic peoples of Central Asia are unquestionably the product of an interracial admixture between Caucasoid and Mongoloid populations in historic times, possibly overlaying an ancient intraracial cline that may earlier have existed across the wide land mass that separates the Mongoloids of Eastern Eurasia with the Caucasoids of Western Eurasia.

In Western Europe and North America today, racial hybridization is proceeding at a remarkably rapid rate, in sharp contradistinction from the situation in most of Asia, where despite exploding demographic pressures, racial admixture still proceeds only slowly. Much of the originally Caucasoid Moslem world has absorbed a substantial percentage of genes from sub-Saharan Africa, primarily due to the work of Arab slavers, facilitated to some extent by the Islamic doctrine of egalitarianism. The Islamic world was noted for its high level of scholarship a thousand years ago, but today the average IQ of the Moslem peoples is notably lower than that of the rest of the Caucasoid world, and it has been suggested that this may be due in part to hybridization with the genes of imported slaves from sub-Saharan Africa. While male slaves were frequently castrated,

⁶ Intelligence, Race, and Genetics, Conversations with Arthur R. Jensen, Frank Miele, Westview Press, 2002, p.124-125.

female slaves were accepted into the harems, and their offspring were accepted into the Arab community. It is interesting to note that the Shiite Arabs of Iraq have a higher percentage of African genes than the smaller Sunni population to their North, and in the course of history eventually fell under the domination of the more purely Caucasoid Sunni.

Caucasoid and Mongoloid Intelligence

It is of interest to note that the highest intelligence amongst Mongoloids is to be found in the more distinctively Mongoloid populations of Northern China, Japan and Korea. By contrast, the peoples of Southeast Asia, while loosely classified as Mongoloid, when set against Caucasoid, Australoid or Negroid peoples, are genetically less purely Mongoloid – being the product of admixture in late prehistory and even in historic times between the expanding Mongoloids from the north and older Australoid, and in some cases, Negrito populations already resident in Southeast Asia.

Today, much is made of the evidence suggesting that the Mongoloids of Northeastern Asia have a higher average intelligence than the Caucasoids of Europe and North America. This is regarded as rather puzzling since despite the fact that the Mongoloids developed and preserved a very high level of civilization, and were responsible for many inventions, in historic times the Caucasoids of the Middle East and Europe seem to have been even more creative.

This conundrum invites speculation. Psychologists have generally explained this by pointing out that Europoid Caucasoid populations display a wide spread of intelligence, with some very high IQ individuals and some very low IQ individuals, whereas IQ in the Chinese, Japanese and Korean populations appears to be much more concentrated in the middle reaches, with fewer very high IQ and fewer very low IQ individuals. Since technological advancement and high civilization is largely the creation of those members of the community endowed with high intelligence, this would explain the higher inventive record of the Caucasoids.

But there may be another factor at work, also. A comparison of patterns of genetic selection resulting from the contrasting social systems that characterized these two great centers of human civilization can offer other avenues that might prove

worthy of investigation. Over three thousand years of history, the highly intelligent intellectuals who ruled China tended to devote themselves to scholarly and administrative pursuits. Regarding military service as an inferior profession, they largely avoided the risks of the battlefield. They also kept concubines, by whom they produced numerous offspring in addition to the children produced by their legitimate wives. This would suggest a strongly eugenic policy so far as the propagation of intelligence was concerned.

In Europe, by contrast, more dysgenic conditions existed for centuries. From Greek and Roman times onwards, members of the ruling classes were expected to lead their people into battle, and to the extent that the more intelligent members of society would tend to drift upwards into the ruling classes, this could only have had an adverse impact on the propagation of intelligence. Furthermore, Europe espoused the Roman Catholic religion for many long centuries, and for generation after generation the Roman Catholic church attracted intelligent individuals from amongst all classes into the clergy or into monasteries, in both of which they were forbidden to produce offspring. This could only have a strongly dysgenic effect, and may well have contributed to a decline in Caucasoid intelligence from possibly much higher historical levels. One element of the population of Europe which from classical until recent times was normally excluded from military service was the Jewish community. Jews had a love of learning, and scholarly Jews, along with the more wealthy members of their community, had no difficulty in finding wives and raising larger than average families. It is a fact that pogroms occasionally cut into the Jewish population residing in European countries, but it has been suggested that the powerful and talented members of this community who commonly became advisors and financiers to Gentile rulers seldom lost their lives in these public upheavals, which fell more heavily on those who lacked powerful protectors. Such selective patterns, if they really existed, would be compatible with the statistical evidence for high Jewish intelligence in the present day.

In short, to the extent that this hypothesis of the contrasting eugenic/dysgenic effect of the Western and the Oriental cultures may be valid, we can readily see why the Caucasoids of Western Eurasia may have been a shade more inventive over the

The Mankind Quarterly

past three thousand years than the Mongoloids of China and the Far East. Indeed, the wide spread of intelligence that characterizes contemporary European Caucasoids may well have been created by a persistent dysgenic birthrate which lowered the overall IQ but, because of the complex social system, allowed an ever-smaller remnant of high IQ individuals to survive at the top. As for the non-European, Caucasoid Moslems, we have already noted the degree to which they have hybridized their genetic heritage, which may explain why, though highly talented in Medieval times, they today, as a whole, average lower IQs than both the Europeans and the northeastern Mongoloids.

Some Causes of Confused Thinking

The Concept of Heritability

Those who are not fully familiar with the literature may be confused by the term “heritability” – which has a very different meaning from “heredity.” Heritability, it is generally agreed, is higher in the case of general intelligence than specific intelligence, which latter relates to such specific talents as verbal ability, visual-spatial ability, musical ability etc. The term heritability does not suggest that some genes are less likely to be inherited than others, merely that the ability to perform some tasks is more readily influenced by environmental factors than by genetic factors alone. Mutations aside, genetic inheritance is a more or less mechanical process. It follows simple causal sequences. But while an organism’s genotype is purely heritable (apart from mutations), the behavior of the phenotypical organism is quite obviously modified very substantially by the environment. Indeed, environmental conditions can prevent the expression of genotypically-determined abilities altogether, or even lead to the death of the organism. In fact one could argue that the concept of “heritability” is of rather questionable scientific utility. Reflecting the relative influence of heredity and environment, any measure of heritability depends on the extent to which the environment differs from that in which the genotype of the organism evolved. The “heritability” of intelligence is going to be very low, as Meisenberg correctly points out, in the case of individuals raised in a backward culture, and nil in the case of an infant abandoned in the Sahara desert, without water, since the ratio between the effects of heredity versus the effects of the environment will be heavily

weighted in favor of the environment. The fact that heritability seeks to determine what we might describe as the ratio between the causal forces of heredity, on the one hand, and of environment on the other makes it easy for us to see why the heritability of "general" intelligence, which does not seem to be very susceptible to modification by modest changes in the environment, is greater than the "heritability" of verbal ability. The latter is clearly influenced by the level of literacy and culture in the society into which a child may be born and reared. But learning does not affect the genetic process by which innate abilities are passed on to succeeding generations as Lysenko believed.

I must make one *caveat* here. It does seem very probable that the human brain may itself be modified in the course of life. A brain that is used in infancy may well develop, just as muscles do; and although the extent to which it will be able to develop will still be determined by heredity, the cultural environment most surely will influence the degree to which it develops its full genetically-determined potential, just as other living organs respond to use and training.

Brain Size

In the course of human evolution, our forebears became not only progressively less prognathous, but fossil remains reveal an increasing skull size necessary to accomodate a growth in brain size as intelligence increased. Racial differences in brain size are well established, and brain size has a correlation with IQ of about +0.40.⁷ However, as mentioned earlier, not all areas of the brain are concerned with cognition and intelligence, and few studies have been published comparing racial variations in this respect. In 1992, F. J. Irsigler, former chief brain surgeon at the Kaiser Wilhelms Institute in Berlin, published a revealing survey of group differences in the human brain, in the Spring 1992⁸ issue of this journal, which was supported by a lengthy bibliography. In this he links phylogeny to ontogeny to explain, for example, that Negro infants, whether born in Africa or in America, are physically and motorically more advanced than

⁷ This was very clearly established as early as 1975, by J. Loehlin, G. Lindzey and J. Spuhler, in *Race Differences in Intelligence*, W. H. Freeman, and has been further confirmed in subsequent studies.

⁸ F. J. Irsigler, Group Differences Revealed in Morphogenetic Parameters, *The Mankind Quarterly*, Vol. XXXIII, No. 3. Spring 1992, pps 285-310.

white infants but later lag behind in cognitive ability. More recent and more advanced techniques will undoubtedly throw much more light on racial differences in the morphology of the brain which have their roots in the phylogenetic history of specific populations.

The So-Called "Flynn Effect"

The discovery by James Flynn⁹ that performance in IQ tests conducted in several countries has improved significantly over the past fifteen years is readily explicable, but has been trumpeted by egalitarians as evidence for the non-existence of innate differences in the intelligence of human populations. It has also been used to ridicule the belief of early twentieth century eugenicists that the Western nations were threatened by dysgenic decline due to less successful members of their communities producing more offspring than the professional classes. Let us therefore look at the realities of the Flynn Effect.

While recognizing that environmental factors such as diet, health, and education can enhance the ability of individuals to develop their innate ability to the utmost, Arthur Jensen has argued that test-taking abilities can improve through practice. Children growing up in a society in that standard IQ tests have become commonplace, and where from an early age they engage in activities analogous to those performed in IQ tests, become automatically practiced in answering such tests with speed and accuracy. He further cited the Milwaukee Project, which found that African-American infants who had been given all-day training aimed at developing their mental skills for several years prior to entering regular school attained slightly higher IQ scores, but that this had no significant effect on their subsequent academic achievement or other kinds of performance that are typically correlated with IQ. In other words, he declared, "the most likely explanation is that the results came from 'teaching the test,' and not really raising the level of *g*."¹⁰

There is also no evidence that the higher IQ scores recorded by Flynn have in any way reduced the persistent disparity

⁹ Flynn, James R., 1984. The mean IQ of Americans: massive gains 1932 to 1978. *Psychological Bulletin* 95: 29-51. Also, 1987. Massive IQ gains in 14 nations: what IQ tests really measure. *Psychological Bulletin* 101: 171-191.

¹⁰ See *Intelligence, Race and Genetics: Conversations with Arthur R. Jensen*, Frank Miele, Westview Press, 2002, pps 132-3.

between the IQ levels of different ethnic or racial groups. Although the level of IQ performance has risen in the countries that Flynn cited, it has raised the level of all ethnic groups without narrowing the gaps that separate them.

Even more significantly, the higher scores in IQ tests are *not* replicated by higher scores in SAT and other tests of practical achievement – if anything the reverse is the case. This would further imply that any improvement in IQ scores due to environmental influences, including familiarity with the kind of intellectual activity required by IQ tests, is not due to any rise in the genetically based, innate component of intelligence, and that the presumed dysgenic trend affecting modern Western societies that concerned earlier eugenicists in Europe and North America may well be an ongoing reality that is temporarily obscured by improvements in the environment. Declining school performance, which has forced educators to lower SAT standards in America, would tend to confirm this.

Although improvements in diet and environment can explain the Flynn Effect, the genome still sets the ultimate limits of the human potential. Elephants cannot fly because they are not born with wings and because they lack the mental and physical attributes that would allow them to design and pilot aircraft. It is highly questionable whether Greeks have benefited from the Flynn Effect to the extent that they excel the intellectual abilities of the classical Greeks, despite the educational opportunities and wealth of accumulated knowledge that today surrounds the great majority who live in modern Greece.

As for the achievement levels of the children of migrants from more primitive cultures who are raised in more advanced Western cultures, I have no reason to doubt that these perform more effectively than in their own homelands. Environment influences the degree to which innate abilities can express themselves, but there is as yet no reason to suppose that genetic factors do not determine the potential limits of human ability. Education, example, and training allow innate abilities to achieve more complete expression, but heredity still determines the limits of potential achievement.

Inbreeding, Outbreeding and Mutational Load

Nobel prizewinner Hermann Muller of the University of

The Mankind Quarterly

Texas did much to draw attention to the problem of “genetic load” – the dysgenic burden of deleterious recessive mutations that accumulate more readily in large populations than in small, inbreeding populations. Human evolution to the level of modernity took place in very small, heavily inbreeding populations. In these small groups dominant deleterious mutations were rapidly eliminated from the gene pool when they expressed themselves in the phenotype, just as in large populations. But harmful recessive mutations were far more rapidly eliminated from the gene pool than is possible in large populations, because close interbreeding causes them to reveal themselves more frequently in the phenotype, with the result that they are more quickly eliminated from the smaller gene pool than they would be in a larger. As Muller pointed out,¹¹ the large, outbreeding populations of the modern world are failing to eliminate harmful recessive mutations in the way that our small, highly inbred ancestral populations tended to do. Inbreeding produces more “village idiots,” a higher ratio of offspring who are phenotypically disadvantaged by inheriting two matching defective genes, but this was precisely the way in which nature removed such harmful genes from the gene pool. When an individual carrying a harmfully mutated recessive gene breeds with another individual who is free from that particular harmful mutation, the harmful gene is likely to be passed on to their progeny. Being cloaked by a healthy dominant gene, it does not show itself in the phenotype of the offspring, and so is likely to be passed on to future generations until the successive accumulation of this deleterious “genetic load” threatens to bring doom upon the entire population. Close inbreeding brings two matching harmful recessive genes together more quickly, and since the resultant offspring will be less likely to reproduce, being phenotypically affected by them, these genes are then eliminated from the breeding population’s gene pool.

Dysgenic Trends

Unfortunately, modern Western culture, including economic forces, contemporary mores and indeed the sentimental application of modern medical science, has

¹¹ See *Out of the Night: A Biologist's View of the Future*, by H. J. Muller, Vanguard Press, 1925, or J. W. Jamieson, “Hermann J. Muller, Nobel Prize-winning Eugenicist”, *Mankind Quarterly*, Volume XLIII, Number 3, Spring 2003, pps 291-304.

produced dysgenic reproductive trends. Whereas in prehistoric and even medieval times the more competent members of a population tended to produce larger families, whose members in turn often had a better chance of surviving to reproduce more prolifically, this is no longer the case. Improvements in educational opportunity have enabled the more intelligent members of the economically deprived classes to move upward economically into the professional strata of contemporary society, where the statistical evidence indicates that they are less likely to have large families and often remain childless. From this, it would seem that contrary to past history it is the less competent and less successful members of society who are producing the greater number of offspring. As Nobel prize winner William Shockley argued, the natural trend toward eugenic reproduction that characterized and made possible the evolution of modern man has been replaced in recent Western society, and increasingly in other societies that adopt Western economic and social systems, by dysgenic trends. Natural selection has been replaced by artificial selection, and the joys of pursuing self-fulfilling careers have diverted talented women increasingly away from the rival joys of producing and raising their own talented offspring.

Communism, Colonialism and Intelligence

Meisenberg has attempted to correlate the available IQ statistics on living human populations who have survived Communist rule. It has been argued that the mass extermination of the aristocratic and prosperous middle classes in both Russia and China under Communism must have lowered the level of innate intelligence amongst these two populations; but because we have inadequate pre-Communist IQ statistics against which to make comparisons, Meisenberg's data provides us with insufficient evidence on which to validate this hypothesis.

The data he provides in respect of the IQ of those populations that have experienced colonial rule suffers from the same defect, if we are to enquire whether colonial rule influenced IQ in any way. His motive for choosing to correlate colonial rule and IQ statistics is not clear. Possibly he has done so in light of the attempt by those who have been critical of European colonial rule to assert that this led to the degradation

The Mankind Quarterly

of so many of the former colonies, overlooking the improvements in education, standards of living and health, cultural and technological advancement that were the reality. His standards for determining which countries experienced colonial rule are also somewhat unclear. Most of the Balkans and the Middle East, for example, experienced colonial rule under the Ottoman Turks until freed by the Treaty of Versailles and the dismemberment of the Turkish Empire at the end of World War I. Similarly, countries such as Brazil were part of the Portuguese Empire for centuries, and Korea was part of the Japanese Empire in quite recent times. But so far as other countries that were European colonies are concerned, the data does not indicate any overriding causal relationship between a history of European colonial rule and IQ. Thus, Singapore is prosperous; Zimbabwe is not.

A closer look at the history and IQ of specific countries would suggest that many fell under colonial rule *because* they were backward and their populations had a lower IQ than the Europeans who took them under their wing. Since being granted independence, those with lower IQs have remained backward despite enormous financial, educational and medical aid from the Western powers and in many cases, rich endowments of natural wealth; others, with higher average IQs, but with few natural resources, have prospered. India, which was already wealthy when the Europeans first arrived, records a relatively high IQ and is generally prospering. Held back by a population explosion of hardly manageable proportions, it comprises a wide variety of separate, genetically exclusive castes, some of very high intelligence and others of middling or even low intelligence. In general, however, with its large population India probably contains quite as many individuals of high intelligence as does the whole of Europe. If it were not for its population problem, which keeps such a large portion of its population pitifully poor, India should otherwise be able to emerge as one of the more prosperous countries in the world of tomorrow.

Conclusion

Statistical evidence indicates that while innate mental ability is essentially genetically controlled, environmental influences contribute somewhere between 20-40% to the ability of

individuals to perform IQ tests and to perform well in challenging environments. Because of this environmental component, some of the disparities in average IQ between populations are due to disparities in diet, health, childhood activities and other environmental factors. That being the case, the extremely low IQs registered in some backward countries are not fully attributable to differences in innate ability.

It has also been stated that the "Flynn Effect" does not affect the genetic component of intelligence, and disparities between ethnic groups remain when both are exposed to the same IQ-raising environmental advantages. Also, statistics recording the average IQ of multi-ethnic populations seldom if ever take account of the presence of hybrid individuals, even when attempting to segregate the test subjects into distinct ethnic groups. The determination of the ethnic origin of the individual taking an IQ test in such ethnically complex societies is generally self-determined and consequently not scientifically reliable. We suspect that the average IQ of racially unmixed individuals in a high IQ mixed race population is probably well above the overall average, even of those deemed to belong to his or her ethnic group, because the average IQ will likely be pulled down by the inclusion of those of mixed descent. Similarly, the average IQ of a low IQ population may be higher than that of the unhybridized members of that group by the superior performance of those of mixed descent whose innate intelligence has been raised by an infusion of genes from other more talented populations. William Shockley presented data in support of this thesis, but it is a hypothesis that needs to be tested against preselected groups whose precise racial identity has been confirmed by genetic testing – a project which is unlikely to attract funding in the current political environment.

IQ population genetics needs not to be a confusing subject, if only those who study it are prepared to ignore political taboos and accept the fact that living individuals and groups of individuals are not all "equal" in physical and mental abilities, and that the genetic differences which we are beginning to accept as significant determinants of our health and physical fitness also play a significant role in determining our mental health and mental functioning.

Book Reviews

Komi Mythology

Edited by A.-L. Siikala, V. Napolskikh and M. Hoppal

Akaemiai Kiado Budapest & Finnish Literature Society,
Helsinki 2003

Komi Mythology, published as a volume in the series entitled *The Encyclopaedia of Uralic Mythologies*, is a remarkable compilation of all aspects of the cosmology and mythic beliefs of the Komi-Zyryan and Komi-Permyak peoples who live in the northern portion of Russia, adjacent to Archangel, Murmansk and Omsk. As is so common amongst ancient peoples, the term Komi may simply be translated as “man” or “Human being.” This 436 page, two-column collection is important because the editors and contributing authors have presented Komi mythology as an integral part of the ancient Finno-Ugric and Samoyed belief system, from which many magical beliefs were borrowed into early Germanic mythology after the Germanic peoples edged the Finno-Ugric hunter-gathers out of southern Scandinavia and much of the rest of northern Europe.

As the aboriginals of northwestern Eurasia, the Uralic peoples, ranging from the Lapps of northern Scandinavia to the Selkups and Nganaans of northern Siberia, had a technology that appears to have been directly comparable to that of the Cro-Magnons of the European Upper Paleolithic. Their mythology may well reflect much of the beliefs that would have been held by the Cro-Magnons. Although the Germanic Indo-Europeans were equipped with a Neolithic culture when they nudged the Uralic peoples out of Northern Europe, the primitive magical practices of the Uralic population were sufficiently sophisticated to attract the attention of the early Germanic peoples, in much the same way as rhythmic African music has caught the imagination of modern Caucasoids and been absorbed into the everyday life of a people who only two or three generations earlier played and danced to much more harmonic music. Thus, the Germanic Woden was reputedly skilled in magical formulas, possibly borrowed from the neighboring “skritlings” or Uralic peoples, while Thor more characteristically reflected the god of a people skilled in agriculture, and depended on the strength of his hammer

Volume XLIV Number 1, Fall 2003

rather than on magical skills.

This is a study intended for the specialist, and it is a comprehensive work that will be much used by those who seek to piece together the most ancient beliefs of early man – particularly of the aboriginal inhabitants of the frozen lands of northwestern Eurasia.

R. R. Peterson

A Short History of the World

Geoffrey Blainey

Ivan R. Dee, Chicago, 2002

Numerous reasons have been given as justification for the study of history, but perhaps the most powerful is that no people without a sense of history have ever developed a culture that has enriched mankind. History serves as a guide, rather as a man lost in the desert is able to look back at his own footsteps and have at least some confidence that he is not walking in circles. Deprive him of any knowledge whence he has come, and the direction of his travels, and he will be disoriented, with no sense of purpose – he will be truly lost.

Unfortunately history is very poorly taught today. In Britain, the emphasis is very much on the history of the past hundred years, as though what went before that was meaningless. At the university level it tends also to become too specialized, and worse still there is a current belief that all men and all cultures are essentially the same, so that there is no need to study the sublime sweep of human history. All the student need do is to study small sections of history, because, it is felt, history is nothing more than a repetition of universal patterns of human behavior, no matter what the time or place.

But at least Geoffrey Blainey has seen far beyond the miasma that obscures our current understanding of the human condition. In his *Short History of the World* he has managed to present a balanced portrayal the momentous journey humanity has traversed. No two times in human history have ever been the same. History is a causal nexus leading mankind on from one stage to another. And the beauty of Blainey's achievement is that he condenses human history from the early Paleolithic onwards

The Mankind Quarterly

in a colorful and graphic way, which is essentially free from didactic political bias.

R. R. Peterson

Black American Students in an Affluent Suburb

John U. Ogbu

Lawrence Erlbaum Associates,
2003 ISBN: 0805845151

Shaker Heights, Ohio seems like the perfect place to live. The neighborhood is highly affluent and the public schools send about 85% of its graduates to college, which makes it one of the better public educational institutions in the nation. Moreover, the community takes special pride in maintaining a high quality educational establishment, as evidenced by its motto: A community is known by the school it keeps. Yet, despite an almost ideal environment, the Black-White achievement gap, prevalent in so many schools across America, is also evident in the schools of Shaker Heights. Being a concerned populace, the Shaker Heights community wanted to understand this reasons why their schools had this unwanted academic fissure. Enter Berkeley anthropologist John Ogbu. His task was to investigate this school district and find out why the achievement gap existed, and his book represents the major crux of his findings.

Ogbu begins his book by briefly reviewing Shaker Heights' history and current demographics, and then he compares the many excuses Black students gave for why they did not achieve at the level of their White counterparts. Ogbu dismisses most of the teacher-centered (e.g., racist pedagogy) or school-centered (e.g., an Eurocentric curriculum) excuses, and, instead, puts the onus for the achievement gap on the Black parents and students, bluntly stating, "Black students in the Shaker Heights school system did not work as hard as they should and could" (p. 32). Next, Ogbu tackles many of the common explanations for the achievement gap seen in popular educational, psychological, and anthropological writings. Because Shaker Heights is a select neighborhood though (i.e., relatively expensive housing and high property taxes), Ogbu points out

that most of the traditional explanations do not apply. The students, both Black and White, come from relatively affluent households that hold education as a high priority, and from neighborhoods that have been integrated for over 40 years. Further, neither the students nor the parents systematically complained of cultural racism or hegemonic educational practices, and the students seemed able to switch from speaking "Black English" at home to speaking proper English at school with relative ease.

Unfortunately, in his sweeping dismissal of popular theories, he also writes that an inadequate IQ hypothesis is not tenable, but his reasoning for dismissing it is contradictory. Specifically, he writes:

....although Black students in the school district scored lower than White students on the Otis-Lennon School Abilities Tests, they performed considerably lower on the SAT than predicted by their performance on the IQ test. Neither did their performance on IQ tests predict their failure rate on the state proficiency examination or their share of the D and F grades in high school (p. 34).

The Black students have lower IQ scores, lower SAT scores, lower proficiency scores, and more Ds and Fs than their White counterparts, yet the inadequate-IQ explanation doesn't hold? Perhaps IQ is not as big of a factor in this particular school district (after all, in an institution where most eventually go to college, there is probably a restricted range of IQs), but to summarily dismiss it as having no explanatory power is one of the book's gravest errors.

Having dismissed other theories, Ogbu then elaborates a cultural-ecological theory that posits the achievement gap is caused by (a) the system (i.e., educational policies, mistreatment of minorities, how minorities are rewarded for academic achievement), and (b) community forces (i.e., frames of comparison of minorities, minorities educational beliefs, educational strategies). Embedded in this theory is the notion that the proposed environmental factors act differently for different minorities, or, to use Ogbu's terminology, they act differently for immigrant minorities (e.g., Asians) than for nonimmigrant minorities (e.g., descendants of slaves). This idea is not new, nor is it particularly accurate. In Taylor's (1992, 82)

The Mankind Quarterly

seminal work, he discusses why the immigrant/nonimmigrant dichotomy fails, observing that:

It is exquisitely irrelevant whether anyone's great-great-great-great grandparents came to America by free will or not. No one chooses his birthplace, so except for first generation immigrants, no one in America has any more choice over his homeland than do the descendants of slaves.

Ogbu spends his next eight chapters expounding on the students' and parents' views of the supposed societal factors that might contribute to the achievement gap: race relations, pupil expectations, leveling (tracking), teachers/counselors, and discipline. Many of the supposed contributors to the gap (e.g., racist academic placements, definitions of success) are not particularly interesting because they regurgitate many of the putative causes that have been around (yet never proven) for decades. What is interesting in these chapters is how differently Black and White students and parents view education. Paradoxically, Ogbu writes that Blacks often view it as the teachers' job to make the students achieve, yet at the same time, he reports that they were more concerned that the teachers "cared" for them and included their experiences/perspectives in the curriculum than about the teachers' expertise and grasp of the subject matter. This is in almost direct opposition to Whites, who tended to think that achievement was a product of individual effort, and that teachers were supposed to be experts in a given field, and were to serve more as navigational guides than as producers of educational success. Moreover, while Whites students were proud of their achievements and their peers often prodded them to achieve even higher, Blacks had a contrary attitude. Many were ashamed to be labeled as smart or successful – what they called "acting white" – because their Black peers chastised success, and thought Blacks who were academically successful as no longer "behaving like Black people."

Ogbu writes that Black adults acted little better than their children in emphasizing the importance of education. Again, the details Ogbu reports are not highly innovative or interesting (and at times becomes quite a laborious read), but his overarching theme is quite fascinating. While Black parents and community leaders give ostensible lip service to the value of

education, they seldom took any purposeful action in this direction. Ogbu reports that most Blacks were not involved in the Parent-Teacher Association in Shaker Heights, nor did many attend seminars the faculty gave on how to promote education outside of school. When the schools had their open houses, the vast majority of attendees were White, even though the majority of students with academic problems were Black.

While he does not totally exonerate the school, community, and teachers in his book, the preponderance of evidence Ogbu gathers leads him to the conclusion that the plight of Black students in Shaker Heights (i.e., the reason for the Black-White achievement gap) is due in large part to their own beliefs and actions. While they might say education is important, many do not believe it, and many more do not act in ways that evidence it. This is not to say that the Black students were not achieving (their performance was much higher than the national Black averages in school performance), but that part of the reason they lagged behind their White counterparts seems to be that they do not put much purposeful, directed effort into their education. Of course, Ogbu's tome has some problems, with the major one being the aforementioned lack of exploration of the effect of IQ. Another difficulty Ogbu's work has is that he never attempts to tease apart whether it's the Black students' anti-education behavior that is causing the achievement gap (what he wants his audience to believe), or whether it is a lack of achievement that is causing the behavior, or if both might be due to a third variable (e.g., cognitive ability). As a result, some of his conclusions are tenuous at best, and blindly naive at worst. Nonetheless, at least he is honest enough to state that it is not some conspiracy on the part of the school system or the "majority culture" that is causing the achievement gap, and, for that alone, makes the book worth the read.

A. Alexander Beaujean
University of Missouri-Columbia

References

Taylor, Jared

1992 Paved with Good Intentions. New York: Carroll & Graft

The Mankind Quarterly

Gramsci, Culture and Anthropology*Kate Crehan*

University of California Press, 2002

Antonio Gramsci (1891-1937) was no doubt one of the most powerful of Marxist ideologists after Karl Marx himself. Although Marx's own beliefs as to how Communists could win power proved totally faulty, it was Marx who provided the dream that has survived to this day. But while Marx spoke of the workers in an industrial society overthrowing developed capitalism, it has only been in predominantly agrarian societies that immature capitalist societies have been overthrown by rebellions fermented not by the workers but by a disenfranchised elite – as pointed out by the Italian philosopher Vilfredo Pareto.

Gramsci's ideology is that of Marx, but his perception of the dynamics of modern society was much clearer. Gramsci saw that developed and highly complex societies could best be won by infiltration of the existing institutions, rather than by attempts to challenge the institutions. It is Gramscian revolutionary tactics that have advanced the Marxist idea in the West, even since the downfall of Communist power in Russia and its decline in China. Gramsci's brand of international Communism continues to advance by way of a "long march" through the existing institutions, instead of overthrowing them. Nations and individuals in the free world are steadily becoming less free as Gramscian tactics continue their advance. As author Kate Crehan, who is clearly a Gramsci follower, reveals, it is not surprising that education and anthropology in particular have been infiltrated by Marxist ideology, for education must be at the center of any move for ideological change; and what more vital and sensitive target could there be than anthropology, the study of human behavior, for those who seek to teach young people how to see the world through the prism that they have themselves chosen?

Marx was obsessed with power, class and inequality, believing that no other real values existed for mankind than these three things. Gramsci was similarly obsessed. Just as Marx believed that race was real, but that international socialism was the desirable goal, so Gramsci believed that nations and nationality were real, but that inequality was evil and that international socialism was

the desirable goal. It would seem that the prevailing breed of Western anthropologists, having been reared in the tradition of Boas and his pupils, have gone further than Marx, declaring that race is no more than a social construct, that ethnic groups exist but ought not to exist, that sexual differences are not real or ought not to be real, and that there is only one threat to continued human advancement – “inequality.”

Crehan's book on Gramsci is excellent, but there is one *caveat* to be made. A tendency that is frequently indulged in is to make “institutions,” in effect, out of single thinkers, making their thought the “turning point” of this or that redirection of others' thinking. This is often a fallacy, similar to the one Leo Tolstoy dissected in *War and Peace*, where he argued that massive underlying forces, not singular individuals who are in fact riding history like a bubble on a wave, are what account for much of what happens during an historical period. In Gramsci's case, we find him writing about a “march through the institutions.” This would probably have happened even if Gramsci had never written: the vast alienated literary and artistic culture that existed, and that was so greatly augmented by that of the “baby boom generation” that came to adulthood during the 1960s, was by a simple matter of demographics going to come to occupy the professoriates, the editorial chairs, and the like, during the final third of the twentieth century. Gramsci wasn't the cause of that burgeoning, communist dominance. He is, however, a thinker whom it is handy to point to as having, at least, articulated what was to happen.

J. W. Jamieson

Black Magic:

Religion and the African American Conjuring Tradition

Yvonne P. Chirau

California University Press, 2003

The magico-religious customs of African slaves brought to the Americas from the earliest times was reported to center around fetishes. As Willem Bosman, a Dutch colonial administrator in the African port of Elmina wrote of African practices in the late 1600s, “they cry out, let us make Feiche, by

The Mankind Quarterly

which they express as much, as let us perform our Religious Worship." The earlier Portuguese navigators who explored the West African coast invented the term "fetish," deriving it from the Portuguese verb "feitico," meaning "to fabricate"; and European missionaries to the West African Coast, from whence the slaves that were shipped to the Americas were derived, described the African serpent deity Whydah as a fetish. In the Americas, African magico-religious practices acquired ideas also from Christianity, and the result was hoodoo, voodoo or "Conjure," the latter term being based on the English term "to conjure" or work magic.

Author Yvonne Chirau, an associate professor of religion at Swarthmore University, has produced a scholarly and fascinating survey of early Afro-American spirituality, which was more magic than religion, in that it represented efforts to control the actions of other men and women, protect against evil spells, and at its highest represented attempts to control the spirit world. Black magic was frequently efficacious, since those who believed that they had become the object of harmful magic worked by others could not be cured of their illness by European medicines, yet often responded to magical intervention by Conjure practitioners working on their behalf.

Chirau examines the relationship between Christianity and Conjure, showing how elements of Christianity became woven into an evolving Afro-American magical tradition. She notes that black magic never developed as fully among the Anglo-Saxon-owned slaves of North America as in the Roman Catholic territories of Central and South America. But Chirau claims that Conjure was a powerful and dynamic, quasi-religious attempt to understand the world, which despite its essentially African origin has absorbed much from contact with Christianity and is "fully alive in the twenty-first century."

"Historically," she writes, "many black Americans have not separated magical beliefs from religion, seeing that the two exist as necessary counterparts. Conjure coexists with Christianity because it is an alternative strategy for interacting with the spiritual realm." She believes that the supernatural is central to mainstream social and cultural activities, and that, whether expressed in Conjure or Christianity or both, African American spirituality provides power to its practitioners in ways that are highly responsive and profoundly creative. Much the same could

be said of the role of Christianity in seventeenth century New England, and her observation is supported by evidence of the influence of black churches and black religious leaders on Afro-American political attitudes into this present century.

J. W. Jamieson

In Search of Ancient Ireland:

The Origins of the Irish from Neolithic Times

To the Coming of the English

Carmel McCaffrey and Leo Eaton

Ivan R. Dee, Publisher, Chicago

Those who live only in the present have only the shallowest understanding of the deeper intellectual pleasures of life. Indeed, people are not cultured beings unless they have some idea of history, and of their own place in history. Everything has a causal context, and the present is only a fleeting moment in the ongoing causal continuum that extends from the past into the future. Consequently, any reader of even part-Irish ancestry will find this book fascinating, and all who have enquiring minds, no matter what their ancestry, will find it an easy read and an absorbing study.

One of the major areas of academic dispute concerns the origin of the Celts in Ireland. When we enter historic times, it is well established that Celtic was the language of Ireland, and that Celtic mythology spoke of an earlier people who had inhabited Ireland before the arrival of the Celts. Until recent times, anthropologists and historians believed that prior to the arrival of the Celts, the Western Atlantic coast of central and southern Europe and much of the Mediterranean was occupied by an earlier Caucasoid race, dark and stocky, and hence named Atlanto-Mediterranean. In Ireland and the rest of the Atlantic European coastlands, it was assumed that members of that earlier population were overrun and either exterminated or reduced to lower-class status by the arrival of a taller, fair-haired Celtic warrior aristocracy. It was explained that their genes would have eventually mingled with those of the Celtic invaders, particularly in mountainous and more unattractive regions such as the bogs of Ireland and the mountains of Wales, thus

The Mankind Quarterly

explaining the presence of darker hair and eye coloring in areas in which the Celtic language survived the subsequent wave of conquest and settlement by Vikings, Anglo-Saxons, Franks and Goths.

However, it is a fact that archaeology cannot tell us anything direct about language in prehistoric times, unless evidence of a written language survives – and because the ancient Celts memorized their history and religious dicta in lengthy poetry and left no written records, archaeology cannot tell us when Celtic was first spoken in Ireland. Of course, this does not mean that archaeology does not provide us with prehistoric evidence of the culture that we associate with Celtic-speaking societies at the dawn of history. Yet, this lacuna has been grasped by those amongst present-day archaeologists who seek to play down the importance of race and physical anthropology, and deny the reality of human conquest and human migration. Denying the reality of race means denying the reality of group competition in history and prehistory, and so it has become fashionable in a politicized academe to argue that even the concept of a “Celtic” *people* is unsound. Thus John Waddell has suggested that “There was a prolonged pattern of contact between the peoples of Ireland, Britain and the continent extending over perhaps thousands of years. This contact could have allowed a Celtic language to slowly emerge in these various localities.”

Such a theory is without either anthropological or linguistic foundation. No languages that were distinct from each other could ever have emerged if there were no social or geographical barriers in history and prehistory. Much more realistic is the view of Donnchadh O Caorrain that the transference of language could only have taken place by the settlement of Britain – and from thence, Ireland, from the continent, where the epicenter of the Celtic languages, both Brythonic (British) and Goidelic (Gaelic), can be demonstrated linguistically to have originated. This occurred when it separated from the proto-Germanic and other related Western Indo-European languages. This migration would have to have involved not merely warriors but whole families, because as the authors observe, “languages tend to travel with women and not with men.” It is from the mothers that children learn to speak. Germanic-speaking Vikings later arrived in Ireland as conquerors, but interbred with Irish women so that their

offspring became Irish and learned to speak the Celtic Irish language in place of their own Norse language.

As the Roman armies pulled out of mainland Britain, Celtic-speaking Irish raiders harassed the British coastline, carrying away slaves to Ireland, including a sixteen year old Christian boy called Patrick, who was to convert Ireland to Christianity, and remains the patron Saint of Ireland to this day. Other Irish raiders, known to the Romans by the Latin *Scoti*, actually settled in what we today know as Argyllshire, bringing the Gaelic language with them, and became such a powerful force that the entire northern part of the British mainland came to be known as Scotland.

In Search of Ancient Ireland actually concentrates more on subsequent early history than on prehistory. The role of early Christianity and the conflict between the Celts, who did not live in towns, and the Viking settlers who were great traders and founded all of modern Ireland's coastal cities, is documented colorfully. So also is the story of the Christian monks, many of whom established monasteries along the wild coasts of Ireland. In time, they learned to fear the raids of the pagan Vikings, as testified by the comment written by a relieved Irish monk in a Latin gospel:

The wind is fierce tonight
It tosses the sea's white hair
So I fear no wild Vikings
Sailing the quiet main.

Dublin, which was to become the capital of Ireland, was founded by Vikings in 841 AD. Names such as Doyle, MacAuliffe, MacIvor and Reynolds are actually of Irish origin, and the Irish of today are as much Germanic as Celtic and pre-Celtic. But Ireland, like India, has a way of absorbing immigrants, and the Celts and the Germans came from a common stock, so that they could not be told apart by their physical appearance. Only the Atlanto-Mediterranean component gives some present-day Irish people a somewhat different appearance from the Celts, Vikings, Norman-French and Anglo-Saxons who subsequently came to Ireland and intermarried with the earlier settlers. Dark hair and blue eyes is an unusual combination that is a fairly common trait in Ireland.

It is a tragic example of the decadence of modern Western

The Mankind Quarterly

society that when builders excavating in the old center of Dublin in the latter part of the Twentieth Century uncovered the site of the early Viking settlement of Dublin, protests by academics from the university against further destruction of this historic site were overridden by the Dublin government, and only scant exploration of the remains was permitted before building was allowed to continue. The building was intended to house new offices for the city administration. An original Viking brick wall had been found intact, but since it stood in the way of the foundations that had to be laid for the new high-rise building, pleas to save it were over-ruled. One concession was made: in their magnanimity the city authorities decreed that it should be demolished brick by brick, and re-erected on a different site, using modern techniques of bricklaying! This is a dire reflection on the intellectual and cultural level of those who lead not just Ireland but so much of Europe today.

In real terms, the prevalent opinion is that Celts, bringing with them a Gaelic version of the Celtic language and Iron Age technology, most probably settled Ireland between 700 and 300 BC. However, other authorities have suggested a much earlier date, around 1200 to 1000 BC, based on archaeological investigation that provides evidence of the existence of a warrior aristocracy so typical of sites on the continent that have direct links to historically-known Celtic societies. Suggestions that a Celtic proto-language might have arrived even earlier, with bronze age technology, are not taken seriously because the Celtic languages are believed to have only separated from the Germanic languages in the second half of the second millennium BC.

In Search of Ireland, although not presented in a dry-as-dust scholarly fashion, comprises a well-balanced and very readable study for the non-specialist.

J. W. Jamieson

The Battle that Stopped Rome:**Emperor Augustus, Arminius, and the Slaughter
of the Legions in the Teutoburger Forest****Peter S. Wells**

W. W. Norton, New York, 2003

A little known archaeological investigation, conducted between 1987 and 1992, has definitively identified the site of one of Creasy's famed "Fifteen Decisive Battles" which shaped world history, and the results of this, combined with research into Iron Age weaponry and Roman military tactics, are presented in Peter Wells's *The Battle that Stopped Rome*.

Fought in the year AD 9, when Roman power under the Emperor Augustus was virtually at its peak, the Battle of Teutoburger Wald which totally eliminated three of Rome's ten Legions stationed in Europe, marked a turning point in Roman imperial power. The number of Roman soldiers that died in this battle has been estimated at twenty thousand. But for this signal victory by the experienced military tactician and royal leader of the Germanic Cherusci nation, known to the Romans as Arminius but whose real name was Hermann, there would be no English, German, Dutch, Danish, Norwegian or Swedish languages today. The entire northern portion of Europe would have inevitably fallen under Roman domination. Not only did this battle block Roman penetration into northern Europe, but it came at a time when post-Republic Rome was undergoing a sweeping social and political transformation which was to continue under Imperial rule, until the eventual collapse of the decaying Empire before the advancing pressure of the more youthful Germanic nation.

Tacitus early praised what he regarded as the moral virtues of the Germanic peoples in contrast to the corruption and venality of latter-day Rome. But the eventual shape of Medieval Europe might never have been possible had the "pacification" and Romanization of the Germanic north proceeded under the Roman General, Publius Quinctillus Varus, whose powerful legions, supported by an agglomeration of mercenary forces, were annihilated in this fateful battle before they could make contact with the Roman fleet on the coast of the German Ocean.

The Mankind Quarterly

Until the present century, our prime knowledge of this epic victory came from the writings of Roman historians, notably those of Vellius Paterculus, in his *History of Rome* written in AD 30, by P. Cornelius Tacitus in his *Annals*, also not long after the actual event, and later by Lucius Annaeus Florus in the second century AD, and by Cassius Dio in the early third century AD. The exact location of the battle was unknown: the literature only indicated that it had been fought in the woods somewhere near Detmold, in the historic state of Lippe.

In 1716, a local scholar by the name of Zaharius Goeze noted the large number of Roman coins found near a small village known as Kalkriese, and in 1885, the renowned historian Theodore Mommsen published *Die Öertlichkeit der Varusschlacht* in which he speculated that the battle may have taken place at Kalkriese. But it was not until 1987 that an antiquarian-minded British Army officer, Tony Clunn, then stationed in Germany, contacted Dr. Wolfgang Schlueter, the head of archaeology in that region. He was pointed to the site by Schlueter, who told him of the Roman finds in that area, and he decided to conduct personal archaeological investigations at Kalkriese.

Clunn found not only Roman coins on the site, but lead slingstones of the kind used by Roman soldiers, and this discovery prompted an in-depth investigation by archaeological teams directed by Dr Schlueter. By the end of 1999, some 3,100 Roman military objects had been uncovered, plus some 1,160 Roman coins and a miscellany of other objects, such as glass game pieces of the kind popular amongst Roman soldiers. In addition, there was a ritual site where Roman weapons had been collected, and presumably offered to the gods by the German victors, and a long turf wall, constructed by the Cherusci, it is believed, as both a defensive position and a place of concealment from behind which they were able to ambush the thin, very long line of Roman soldiers, wagons and camp followers, as they wended their way through the marshy, wooded valley which was to be the scene of their annihilation.

Ambushed in this manner, the twenty thousand Roman foot soldiers and cavalry were unable to adopt their customary battle formations, and according to Roman historians a three-day long running battle ensued, with all the advantages on the side of the Germans. As the outcome of the battle became apparent, with the almost unbelievable loss of the three highly trained and

disciplined legions he commanded, the Roman general Varus fell upon his sword in the traditional Roman fashion of those who had been dishonored. Back in Rome, the Emperor Augustus cried out, when he heard the news of this epic defeat, "Varus, Varus, Give me back my Legions."

Northern Europe was saved from Roman domination, and while Latin was to become the basis of the French, Spanish, Portuguese, Romanian and Italian languages of today, the Germanic languages of northern Europe survived. Perhaps equally important, the genetic constitution of the peoples of Northern European was not to become as commingled with that of other peoples, as did the genetic heritage of the other European countries which fell under Roman rule, for the Roman legions of the Imperial period were no longer filled by Romans, but were recruited from almost all corners of the Roman Empire. Roman legionaries were not allowed to marry, but they unquestionably bred many children amongst the peoples in whose lands they were stationed.

Yet one of the characteristics of the Germanic nations, as of other Europeans, has been their weak sense of racial loyalty – their readiness to fight against their own kinsmen. This was apparent in the two great wars of the twentieth century, which in Europe were essentially fratricidal wars, as well as in the bitter conflicts arising from the rivalry of European nations during the empire-building period of the second half of the second millennium. This fratricidal warfare was characteristic of the Germans and other Europeans in the time of the Renaissance, as also of the Middle Ages. It was characteristic of the nations of Ancient Greece, and it was characteristic of the Germans of the Roman period. Thus the Roman armies were often partly composed of Germanic recruits and supported by German forces in combat against free German nations, and when Rome sent fresh legions into Germany in an unsuccessful attempt to reinstate Roman influence north of the Danube, they were supported by no less a person than the brother of Arminius, known to the Romans by the name of Flavus.

Tacitus reports that the two brothers, Arminius and Flavus, argued with each other across the banks of the Weser, with Flavus standing with the Romans on the West bank and Arminius at the head of his loyal Cherusci, on the East bank. Thus he writes:

The Mankind Quarterly

Flavus insisted on 'Roman greatness, the power of the [Emperor]... and the mercy waiting for him who submitted himself...' His brother Arminius urged 'the sacred call of their country; their ancestral liberty, the gods of the German hearths; and their mother, who prayed, with himself, that he would not choose the title of renegade and traitor to his kindred...traitor to the whole of his race...

While the Romans claimed victory over Arminius in this later conflict, the historical fact is that the Emperor Augustus and his successor Tiberius abandoned further attempts to conquer the northern part of Germany, and that in the end it was the Germanic peoples who, several generations later, wrested control of Western Europe – the Anglo-Saxons settling England, the Franks settling France, the Burgundians settling Burgundy, and the Lombards settling Lombardy. The Goths actually seized Rome, and swept through the Balkans, Italy, southern France, and Spain, while their close relatives, the Vandals, moved on to settle Andalusia and then to conquer much of north Africa, only to be absorbed into the sands of history.

In the course of time the Cherusci nation merged with other Germanic peoples; so who are the nearest descendants of the Cherusci amongst the present day speakers of Germanic languages? That honor most probably falls to the Saxons of northwest Germany, but includes also the Anglo-Saxons who gave England its name, and in the course of time settled so much of the present-day United States and Canada.

This book records an event of vast worldwide, historic importance, which is a part of the common history of the English and German-speaking peoples of today – although it has been little taught since the fateful events of World War II. Indeed, following the defeat of Germany in that war, emphasis has been placed in German textbooks on whatever evidence can be found of German cooperation with the Romans, in harmony with the political goal of a united Europe. What a terrible symbol it is of the current ignorance of history amongst the nations of the West that in World War II a British warplane returning from a bombing raid against the German heartland, and spotting the impressive nineteenth century bronze statue erected in honor of Arminius on the crest of a hill in the Teutoburger Wald, close to the actual scene of his victory at Kalkriese, chose to use up some of its ammunition on the

memorial commemorating the man without whose victory that pilot's own language would not have existed today.

Wells has presented us with a valuable survey which augments what we already knew about the battle from Roman literary sources with the solid evidence provided by contemporary archaeological investigation. It also describes contemporary German and Roman military equipment and tactics. Some readers may find his description of the experiences of those engaged in the battle to be over-reliant on his own subjective interpretation of what it would be like to be involved in such a conflict, on the grounds that he ignores the likelihood that the cultures of both the Germans and of the Roman legionaries could have caused them to experience somewhat different emotions from those that he ascribes to them. Certainly his style is the diametric opposite of that utilized by Creasy in the latter's account of the battle (based solely on Roman literary sources), but that does not detract from the fact that Wells is able to include archaeological evidence not available to earlier writers, and, all in all, in addition to the new information it contains, the book is undoubtedly "a very good read."

J. W. Jamieson

The Mankind Quarterly

Shockley

on Eugenics and Race



**Selected writings on Eugenics and Race
by Nobel Prize Winner William Shockley**

Preface by Arthur R. Jensen

Roger Pearson

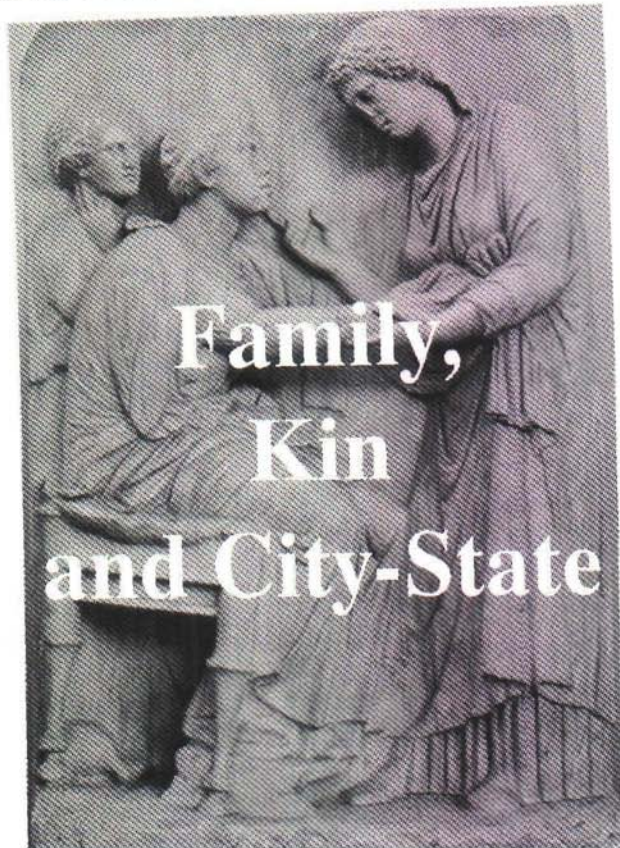
Paperback. 296 pps. ISBN 1-878465-03-1

\$26.00 Plus postage \$3.50 (USA) \$5.50 (foreign). VISA and MC welcome.

Scott-Townsend Publishers

**Tel: (202) 371-2700, fax: (202) 371-1523), email: socecon@aol.com or send
US Cheque or Money Order to P.O. Box 34070, N.W., Washington, D.C. 20043**

Numa Denis Fustel de Coulanges



The Olympians were not the only source of religion in ancient Greece and Rome. More important was the worship of the lineage, symbolized by the sacred hearth fire and the reverence in which the ancestors were held.

Edited and abridged by J. Jamieson. ISBN 1-878465-34-1. P/back, 108 pages
Price: \$16.00. P&P \$3.50 (USA) \$4.50 (foreign). Visa and Mastercard accepted

Scott-Townsend Publishers

P.O. Box 34070, Washington D.C., 20043

Tel: (202) 371-2700 Fax: (202) 371-1523 socecon@aol.com